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The Sir Richard Stawell Oration.[1]

By C. BICKERTON BLACKBURN, M.D. (Sydney),

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WHILE expressing my very great appreciation of the honour the Trustees have conferred upon me in inviting me to deliver the first Sir Richard Stawell Oration, I should like at the same time to refer to the great personal pleasure it affords me to have this opportunity of publicly assuring Sir Richard Stawell of the almost unprecedented esteem and affection in which he is held by the whole medical profession of Australia.

I wish also to congratulate the Trustees, and to single out from them in those congratulations Dr. Rowden White, for having conceived and brought to fruition this very delightful, if somewhat novel, idea of perpetuating the name of this great physician while he is still in the prime of his life and likely for many years to remain the outstanding personality in medicine in this Commonwealth. The unusual conditions, however, impose some embarrassment not generally encountered by a first orator, and in case some of those present tonight may feel disappointed with the somewhat shadowy outline I propose to give you of Sir Richard Stawell's career, I would fain disarm your criticism by reminding you of his presence here tonight, and confiding to you that he has strongly vetoed any such intimate disclosures as are customary when discussing a distinguished career that has come to its close.

It is peculiarly fitting that homage to a member of the Stawell family should be an integral part of these centenary celebrations, for the name of Stawell has had a pleasant and honourable ring in the ears

[1] Delivered at Melbourne on October 12, 1934.

of the people of Melbourne almost throughout the entire existence of the city, and it is to a great extent due to the wise guidance of the Stawell family that the State of Victoria has been enabled to set an example to the whole Commonwealth in its political, legal and medical standards.

This benign influence began to be exercised within eight years of the founding of this city when a young Irish barrister, William Stawell, arrived in 1842. He immediately interested himself in the problems facing his adopted country, and placed his remarkable legal knowledge at the disposal of his fellow colonists. His outstanding ability, enthusiasm and transparent honesty early brought him into such prominence that when in 1851, nine years after his arrival, Victoria was erected into a separate colony, he was nominated by the Crown to the first Legislative Council, with the office of Attorney-General.

Among the many services he rendered in this capacity perhaps the most notable was his assistance in preparing the Constitution Bill under which the first parliament was established. Though himself elected to Parliament, it was felt that his legal attainments could be better utilized, and in 1859 he became Chief Justice and received the honour of knighthood. The choice was a very wise one, and in some of the anxious situations that the young colony had to face in the succeeding years, it had often good reason to be thankful that it had at the legal helm a man with the dignity and attainments of Sir William Stawell. The standard he set and demanded was of a high order, and it is largely to his early guidance that the high reputation of the legal profession in this State is due.

Apart from his legal responsibilities, Sir William accepted to the full the responsibilities of citizenship, and he exercised a strong influence in many directions, particularly interesting himself in educational and scientific advancement. Among the many distinguished positions he filled may be mentioned that of Chancellor of the University, President of the Royal Society, and President of the Melbourne Hospital, where one of his sons was destined later to play such an important part. When Sir William Stawell died in 1899, his son, Richard, recently qualified, was holding a resident appointment, but the name was still a household word when it began to have a new meaning and men began to think of its medical instead of its legal relationships, and so the continuity has been preserved.

When on qualifying in 1888 with first-class honours in medicine he was awarded the scholarship in medicine, it appeared that fate had already singled out Richard Stawell as a physician, but I have it from Sir Richard himself that at this period he had definitely decided to devote his life to research. In coming to this decision, he had been largely influenced by his contacts with two great teachers whose memory is very dear to many who are here tonight. I refer to Sir Harry Allen and Dr. Williams. He was also in the fortunate position of having inherited an income that seemed likely to relieve him of the need to enter into competitive practice.

After spending two years in holding resident appointments and taking his doctorate, he decided to go abroad. Travelling through America, where he spent some time at the Johns Hopkins University, and where he visited hospitals in Philadelphia, New York and Boston, he settled down to serious work in London. Obtaining a clinical clerkship at Queen's Square, he was amazed at his ignorance of neurology, and at once set about rectifying the position, soon finding that he had a singular aptitude and liking for this branch of medicine, in which he has since so greatly distinguished himself. At the Brompton Chest Hospital he learned refinements in the recognition of the physical signs of pulmonary diseases far in advance of the teaching in his own school at this time. Bacteriology, also, in his student days had been little more than a name, but was established in England on a firm basis, and, finding that it was a requirement for the Diploma in Public Health, he determined to sit for the diploma and thus have an opportunity to study bacteriology under Klein.

After spending a further year on the Continent of Europe, he returned to Melbourne in 1893, to be greeted with the news that his assured income had vanished in the financial crash that had taken place. This disaster sounded the knell to his hopes of a life spent in academic research, and he found himself compelled to turn his clinical knowledge to practical account. It is, of course, futile to conjecture what accretions to our knowledge have been lost through this change of plan, but there can be little doubt that research carried out by so well ordered a mind would have been crowned with success. On the other hand, there is no question that the chance that determined that Richard Stawell should become a practising physician and clinical teacher has been an inestimable boon to countless numbers of his contemporaries, both directly from his own ministration and indirectly through the help of those who owe their skill to his teaching. Nor, perhaps, has research suffered so greatly in the long run, for the remarkable investigations that have been carried out in the research institutes of this city can be to a great extent attributed to his influence.

Faced with the necessity of earning his living, young Dr. Stawell found his special training in pathology very useful as a means of supplementing his income in the early period of practice, and for some years he conducted many of the *post mortem* examinations ordered by the City Coroner. At a later date he held for some time the post of Honorary Pathologist to the Saint Vincent's Hospital. His skill as an anæsthetist also stood him in good stead, and it was not long before he was in such demand in this capacity that he found his anæsthetic work interfering with his private practice.

His election to the staff of the Children's Hospital as Assistant Physician in 1893 gave him his first teaching appointment, and the fifth year students who had been apt to grudge the time they were required to spend at this hospital quickly realized that there was a new star in the firmament, and began to flock to his clinics in almost embarrassing numbers. When, after ten years of waiting, the doors of the Melbourne Hospital were opened to him in 1902, he had established such an outstanding reputation as

a physician and teacher that the profession realized that their leader had at last come into his own.

From his first association with the Melbourne Hospital, he gave his time and energy unstintingly in its interests, concerning himself not only with its medical aspects, but also with its general administration.

In 1906 he was elected a member of the Committee of Management of the Hospital, and after holding office for many years, he is still Chairman of the House Committee, while in 1928 he followed his father's example and became President of the Hospital. While his personal reputation as a clinical teacher was steadily enhanced, Dr. Stawell's association with the Melbourne Clinical School had far-reaching effects, and through his influence and example a steady improvement took place in the standards of teaching and examination. Indeed, special reference should be made to the enormous amount of time he gave up to taking part in the clinical examinations of the final year and the infinite pains he took to assure himself that each candidate had a fair and equal chance.

As his fame spread, it was natural that those in the other States should be anxious to share in his teaching, and he has set a splendid example to other distinguished members of his profession in the unselfish way in which he has sacrificed his time and his income in responding to the many calls made upon him. Among his more notable contributions to the instruction of the profession at large may be mentioned The Bancroft Memorial Oration in Brisbane in 1929 and the Halford Oration at Canberra in 1930.

He has been for many years a familiar figure at the triennial Australasian Medical Congresses, and was President of the Section of Medicine at that held in Brisbane in 1920.

When the Association of Physicians in Australasia was recently formed, he was elected the first President, as a matter of course.

When the Great War broke out his prompt offer of service was gladly accepted by the Commonwealth Government, and he was attached to the Third Australian General Hospital, with the rank of Lieutenant-Colonel, and sailed for Egypt early in 1915. In the strenuous period following the landing at Gallipoli his hospital was stationed at Lemnos, and Colonel Stawell found himself often called upon to be more of a surgeon than a physician. The constant strain and the insanitary conditions led to a break down of his health, and he returned to Australia in 1916, where he at once volunteered for home service. When in 1919 the Medical Advisory Committee to the Repatriation Department was constituted, he was invited to become a member, and he has ever since devoted much time to this responsible work.

For his distinguished services to the Commonwealth he received the honour of knighthood in 1929, the announcement of which gave the greatest possible satisfaction to the whole medical profession.

Throughout his career Sir Richard Stawell has evinced a keen interest in matters concerning the general welfare of his profession, and as early as 1895 he was elected a member of the Committee of the Medical Society of Victoria. In 1906, during his Vice-Presidency of this body, he took a prominent part in the negotiations which led to its amalgamation with the Victorian Branch of the British Medical Association. Four years later, now President of the newly constituted Branch, he was again exercising his tact in trying to bring about the amalgamation of the two Australian medical journals, the *Australasian Medical Gazette*, published in New South Wales, and the Victorian paper, *The Australian Medical Journal*; an idea which came to fruition in 1914 when a new paper, THE MEDICAL JOURNAL OF AUSTRALIA, became the official organ of all the Branches of the British Medical Association in Australia.

It is a fitting climax to this long record of service that the Parent Association has now conferred upon Sir Richard the highest honour in its disposal and appointed him President of the British Medical Association in 1935. The appointment has given great pleasure to his colleagues throughout the Commonwealth, who have the fullest confidence that the first Australian President of the Association will support his high office with grace, dignity and wise counsel unsurpassed by any of his distinguished predecessors.

In speaking of one who is thus adding to his distinctions and still extending the sphere of his activities, it is perhaps rash to prophesy, but I do venture to think that by posterity Sir Richard Stawell will be best remembered for his clinical teaching, and I believe he would have it so. For this he is ideally fitted by his wide learning, his clinical acumen, his enthusiasm, his friendliness, his common sense, his eagerness to make others see what he sees, his capacity to make them want to see, his despair when they cannot.

In his actual teaching he adopted the Socratic method, tempering its application to individual idiosyncrasies, which he was quick to appreciate, and if there are some present who can recall playing quite unflattering parts in Stawell dialogues in which their diagnostic rashness had involved them, there are others who cherish memories of friendly help and encouragement during an early period of self-conscious aphasia. All will agree as to the debt they owe to the friend and teacher as a tribute to whose greatness the Sir Richard Stawell Orations have been established.

While my selection of "The Teaching of Clinical Medicine" as my theme tonight is to a large extent a tribute to one who has made it his special province, I feel confident that it is a subject of very practical interest to many present in this gathering. So much criticism has been recently levelled at the present system of medical education, especially in English speaking countries, that it seems opportune to review our own.

So insistent has been this criticism, that within the last two years two important reports on medical education have been published, the first supplied by a representative American committee in 1932, and the second only a few months ago by a committee appointed by the British Medical Association in Great Britain.

It is interesting to note that in both these reports one of the chief subjects of debate was the relationship between the purely scientific education of the undergraduate and his clinical instruction, that is, his actual contact with patients. This question of the relative importance of the academic and practical aspects of medical teaching is no new problem in the history of medical education, though it has assumed enhanced importance since in recent years we have become so dependent on the ancillary sciences for the advancement of our medical knowledge. It apparently first took form as far back as the fourth century B.C., when Aristotle, possibly the greatest scientist of all time, reviewing the clinical records of the famous Hippocrates in the light of his biological and anatomical researches, demonstrated the value of scientific knowledge in the solution of medical problems. Thenceforward, for nearly two thousand years, all intellectual thought not reserved for religious meditation and disputation was focused on the infant sciences, which presented an almost limitless field for inquiry, and the teaching of medicine became exclusively academic and scientific in character. This was still further accentuated with the rise of the universities, in which it soon became possible, after a period of scientific study, to obtain a medical diploma by virtue of a spoken disputation, without ever seeing a patient.

We owe our modern ideas of medical education chiefly to the great Dutch teacher, Hermann Boerhaave, who was appointed to the Leyden University at the beginning of the eighteenth century. Not only a great clinician, Boerhaave was also a skilled chemist, botanist and anatomist, and while he gave instructions in all these subjects, he also brought them to bear on his clinical teaching, and soon made Leyden the most famous school of his day. British medicine owes a great debt to Boerhaave, whose pupils founded the Edinburgh Medical School, which for many years set the standard for medical teaching in the British Isles.

Under the new stimulus clinical teaching in England gradually attained a very high standard and was preeminently carried out by the visiting staffs of the large London hospitals. In proportion to their reputation as teachers, these men attracted large groups of students, who paid them premiums to undergo a virtual apprenticeship, learning their medicine by seeing it practised.

As knowledge of the underlying sciences grew, it became impossible for practitioners to impart all medical knowledge, and so a staff grew up, composed of scientists and clinicians, and many of the hospitals developed into medical schools in which students, no longer permitted to select their own teachers, enrolled as they would at a university.

When the *Medical Act* was passed in England in 1858, setting up a Central Medical Council to control medical education, this body wisely made no attempt to introduce a uniform system of medical education, but officially recognized all types of medical qualification, the requirements for which conformed to a certain minimal standard. They divided the thirty-five existing medical schools into two groups, one of twenty-three qualified to train for the examinations of the licensing bodies, and the other of twelve to prepare for the examinations of the University of London, which acts as a purely examining body.

There was nothing haphazard about the organization of medical education in our own country, since it was obvious that without conforming closely with the requirements that had by that time been carefully drawn up by the General Medical Council we could not hope to secure recognition of our degrees in Great Britain.

What have since become known as the medical schools of Melbourne, Sydney and Adelaide were established as Faculties of Medicine in the universities of these cities in the order given. These schools differed in two important details from the London medical schools just mentioned. As university faculties they had the advantage of being able to conduct their own examinations, but through not being established in hospitals, they have to make arrangements for extramural facilities for their students.

The Sydney school was fortunate in being able to arrange that a fund raised in New South Wales to erect a memorial to the recovery of His Royal Highness Prince Alfred from his attempted assassination should be devoted to the building of The Prince Alfred Hospital on a part of the land dedicated to the University, and that one of its chief objects should be to serve as a clinical school, over which the Senate of the University was to have joint control with the Board of the Hospital, on which, again, the University had official representation.

The Faculties of Melbourne and Adelaide were not so fortunate, having to depend upon the goodwill of the Boards of Management of hospitals already in existence to secure clinical training for their students.

Some of the difficulties that arose early demonstrated the paramount importance of a university having an adequate voice in making appointments to the medical staffs of hospitals in which they are responsible for the clinical teaching. Naturally, under the charters or other conditions of foundation of non-university hospitals, the control of appointments is vested in the governing body, and any modification can be only on a voluntary basis; but as time passed a satisfactory working arrangement was arrived at and when, as the number of students grew larger, it became necessary to coopt other hospitals as clinical schools, more satisfactory terms were laid down from the start.

As certain special problems arose out of this distribution of the clinical teaching over a number of hospitals, it will be convenient at this stage to refer to the measures adopted for their solution, and I shall take as an example the conditions obtaining at the University of Sydney, with which I am most familiar. This University has established clinical schools at the Royal Prince Alfred Hospital, the Sydney Hospital, and the Saint Vincent's Hospital, which have been selected partly on account of their size and partly for their accessibility. This latter is of considerable importance to a teaching university in which lectures other than clinical are delivered within its precincts. Fortunately, all three schools are comparatively near to the University, and each

being located more or less in the course of one of the three main streams of traffic leading from the city, is geographically convenient to a separate group of students.

Recognizing that the establishing of a clinical school imposes the responsibility of raising it to the highest possible state of efficiency, the Faculty interests itself not only in the standard of teaching given, but also in seeing that a reasonable number of students attend.

Since the introduction of the system of appointing clinical assistants for not more than two years in succession, there has been more opportunity of ascertaining the teaching capacity of candidates applying for vacant appointments, and this always receives very full consideration.

The allotment of students to the various hospitals is based on the number of beds available in each, which is roughly in the ratio of 3 : 2 : 1. As far as possible, students are allowed their choice of hospital, which all are invited to indicate, but in actual practice it has been found most satisfactory to allow those in the upper half of the pass list at the end of the third year to select their school, and then to place the others, partly in deference to choice, partly in relation to geographical position, and the rest by lot. A somewhat similar plan is adopted in allotting resident medical officers at graduation, as it is felt that a less uniform standard of teaching might result if it were possible for all the honour graduates to gravitate to the same school.

Soon after the founding of the Australian medical schools the tide that under Boerhaave's attraction had kept the clinical aspect in the forefront of medical education for so long, began to ebb. Increasing knowledge in physiology, anatomy, pathology and bacteriology made it necessary to allot more and more time to these subjects, while the development of the medical and surgical specialties with the establishment of courses of lectures upon them led to the filching of further precious hours from the little left for clinical teaching.

At last it became so evident that the young graduate was being turned out like his prototype in the middle ages, well steeped in scientific lore, but quite inadequately trained in the practical application of his knowledge, that a reaction set in with a general demand that more time should be made available for clinical work. The changing point of view is well reflected in the alterations that have taken place in the curriculum of the Sydney school, to which I intend to confine my remarks, as I am less familiar with the sister schools of Melbourne and Adelaide. In these schools, however, the evolution of clinical teaching has proceeded on substantially the same lines.

When the school was opened in 1883 the curriculum provided a four years course of study, in which clinical teaching began in the second year, but when six years later the course was lengthened to five years, hospital practice began in the third term of the second year, and thus extended over three and a quarter years. In 1893, however, the preclinical work was allowed to usurp the whole of the first three years, clinical study being relegated to the last two, and this arrangement was undisturbed for twenty-nine years. In 1922 the clinicians at last became articulate and the course was lengthened first to five and three-quarter years, and four years later to six years, the last year being devoted to clinical work and the study of the special subjects. Since then the general principle has been accepted of dividing the medical course into equal preclinical and clinical periods, the quite considerable changes that have been made having been designed to remedy defects observed in the 1926 curriculum when in actual operation.

One cogent criticism offered was that under the existing system the student was liable to regard his preclinical work, especially anatomy and physiology, as a hurdle to be jumped into medicine, rather than as a staff on which to lean as he passed through it. Another objection was that more time was given up to lectures on the medical and surgical specialties than was justified by the educational needs of a student, which are essentially general in character. It was further urged that the clinical clerkship in the final year would have an enhanced value if the student had received such teaching as was essential in these subjects before he entered it.

An opportunity for revision came in 1928 when, through the munificence of a great benefactor of the University, Mr. George Bosch—whose recent death we still mourn—whole time chairs in medicine, surgery and bacteriology were established, and the new professors of medicine and surgery were invited to make this their first business. In the curriculum drawn up by them and brought into force in 1930, many of the objections to its predecessor have been met, while several new features have been introduced. Better coordination between preclinical and clinical work is being brought about in many ways, especially by having refresher lectures in physics and chemistry correlated with medical lectures in later years, and it is hoped to make similar contacts in other directions. Systematic lectures in the medical and surgical specialties have been considerably reduced in numbers, and are delivered by lecturers in the subjects as an integral part of the systematic teaching in medicine and surgery, which takes the form of a conjoint course of lectures extending over two terms in the fourth and one in the fifth year. No set written examination is held in the special subjects, any more than in any other part of the systematic lectures, but a *viva voce* examination takes place in each of them after clinical instruction during the fifth year, and a certificate of having passed all these tests has to be submitted before permission is granted to sit for the final examination.

During the fourth and fifth years clinical and tutorial instruction is given in the three clinical schools in medicine, surgery and gynæcology, and in the specialties dermatology, ophthalmology and oto-rhino-laryngology. In addition, during the fifth year successive groups of students from all the schools receive clinical instruction in obstetrics, pædiatrics, infectious diseases and psychiatry at special hospitals recognized as clinical schools for this purpose.

By this allocation of the work in the earlier clinical years, the object has been attained of having the student enter his final year with a working knowledge of all his subjects, and free to devote his whole time to hospital practice. He spends his entire day from 9 a.m. to 5 p.m. in the precincts of his clinical school, the only lectures he attends consisting of a course of clinical lectures in medicine and surgery, a short course of lectures on the history of medicine, and a refresher course in obstetrics.

To encourage a sense of responsibility the sixth year clinical clerks are assigned the duty of taking the official histories of the hospital, while the resident medical officers, who are relieved of this duty, are required to initial each page as an indication that they have found it correct.

It is found that this innovation needs only the cooperation of the administrative staff to work satisfactorily, and that it definitely tends to bridge the gap hitherto existing between undergraduate and graduate status. Not only does the student quite seriously accept his responsibility, but the young graduate finding it best, whenever possible, to have the clerk with him during his own examination of a patient, automatically drops into his proper rôle of first link in the teaching chain.

While the curriculum just outlined is giving great satisfaction, it is felt that the three years devoted to clinical study are still too overcrowded, and there are many who wish to see the preclinical work completed at the end of Michaelmas term in the third year so that some of the lectures in pathology, and perhaps some tutorial teaching, could be given before the commencement of the fourth year. For some years past the possibility of bringing about this change has been frequently examined, and it is noteworthy that a similar suggestion is contained in the recent report of the Committee of the British Medical Association.

An additional and very cogent reason for this step arises out of the recommendation of the General Medical Council, adopted in 1933, that three full years should elapse between the passing of the examinations in anatomy and physiology and the sitting for the final examination. Under the system existing in Australian medical schools of holding one final examination in medicine, surgery, obstetrics and gynæcology at the end of the sixth year, it is obvious that if this recommendation is literally carried out, students who fail at the end of the third year will have to lose an entire year, even though they pass a deferred examination three months later. If, however, the third year examination takes place three months earlier, deferred candidates will have an opportunity of retaining their position by passing at the end of the third year.

It should be mentioned that the same difficulty does not arise in England, since the examining body of the London University holds repeated examinations throughout the year.

Actually, however, the difficulty of compressing these two very important subjects, anatomy and physiology, into five terms is very great. My own revolutionary suggestion, offered with some temerity, that an undue proportion of the six years was devoted to dissection, was countered by the reply that any time that could be gained by reducing this period was urgently needed for anatomical teaching that ought to, but could not, be given at present. The possibility of giving some of the lectures in anatomy, especially surgical anatomy, and some on the more advanced physiology later in the course in conjunction with their clinical application, has been examined, and might be practicable if the expense of the additional staff required could be met. If, on the other hand, a high matriculation standard in preliminary science could with the cooperation of the educational authorities be imposed on those proposing to enrol in the Faculty of Medicine, anatomy and physiology might be entered on in the third term of the first year, and all difficulties thereby solved.

Another question under discussion in Great Britain at present, and worthy of our own careful consideration, is whether clinical teaching should be regarded as completed at the end of the sixth year. Practically in the vast majority of cases it is continued for another year under the most favourable circumstances possible, the young graduates serving as hospital resident medical officers in close personal contact with senior physicians and surgeons, as well as specialists in other subjects.

Unfortunately, this post-graduate course of teaching is purely optional, and if any fail for any reason to obtain it, it is more often than not those who pass lowest on the list and who, therefore, need it most. The British Medical Committee has suggested that some plan should be adopted to provide that full licence to practice should be granted only when the graduate has completed a further year of experience under observation, either in a hospital, or in some position where his work can be supervised.

Some reference may here be made to the influence of clinical research upon undergraduate teaching.

While the vast accumulated store of medical knowledge may be justly regarded as the pooled result of an infinite series of clinical and scientific investigations, recent years have witnessed an extraordinary development of organized clinical research throughout the civilized world, using as its main basis the great store of clinical material available in public hospitals. This movement has been already of incalculable benefit to mankind, and must be of ever increasing value, since under the freemasonry of medicine every additional piece of knowledge at once becomes the common property of all.

It is naturally in the teaching hospitals, where the best facilities for research are available, that the most valuable investigations are being carried out, and members of their staffs are realizing in ever increasing numbers their responsibility not only to utilize each new discovery in the investigation and treatment of their patients, but also to add their quota to the common store.

While there can, of course, be no doubt as to the immense value of this scientific atmosphere upon the student's ultimate outlook upon medicine, there is need for great care lest at this immature stage of his development his clinical perspective should be so distorted by the various hæmatological, biochemical,

radiological and other investigations he sees carried out that he may fail to appreciate the value of the education of his unaided senses. Moreover, there is a definite danger that unless he is constantly reminded of the fundamental responsibility of the physician to heal the sick, he may tend to develop an interest in the study of disease itself, quite detached from any thought of the welfare of its unfortunate victim.

Further, the increasing tendency for teaching hospitals to become the repositories of rare and complicated forms of disease is liable to engender an altogether erroneous idea of the importance of such cases in medicine, and affords an additional argument for familiarizing the student with the more common ailments in the out-patients departments during their fourth and fifth years before spending the final year in intensive study in the wards.

For the actual carrying out of the details of the hospital curriculum, the University recognizes its dependence upon the goodwill and enthusiasm of the boards and medical staffs of the clinical schools. In the desire to foster a spirit of loyal cooperation with the faculty and a healthy rivalry among themselves, every effort is made, while avoiding meddlesome interference, to show a benevolent interest in their problems, and by such means as insuring an equal distribution of students and resident medical officers to indicate that the University is actuated by the single purpose of bringing each school up to the highest possible level of efficiency.

The special type of liaison existing between the University and the clinical schools is met by the establishment of boards of medical studies responsible for the actual organization and supervision of the programme of clinical teaching laid down by the faculty.

On each of these boards of medical studies the university is officially represented by the professors of medicine and surgery, who take a very active part in the deliberations, while the Dean of the Faculty of Medicine is a regular attendant at the meetings. In all the schools, those holding such salaried appointments as tutors, clinical lecturers and student advisers are university officers, and are appointed by the Senate on the recommendation of the professors of medicine and surgery, after consultation with the respective boards of medical studies, and after formal approval by the hospital board.

The student adviser is an important factor in the successful carrying out of the scheme. A member of the junior staff of the hospital, and corresponding in his office in some respects to the sub-dean in other schools, he supplies the personal contact between the individual student and the board. On him devolves the duty of arranging the groups to attend the various clinics, to see that the students attend regularly, to advise them in the many minor difficulties with which they are confronted, and particularly to keep the board advised of any defects in the coordination of the system of instruction they are directing.

This joint system of control is working smoothly, and it is felt that a reasonably satisfactory scheme has now been evolved for bringing the undergraduates into contact with every phase of the clinical work.

Brief reference may now be made to actual details of the teaching of clinical medicine, for it is on the ability and enthusiasm of the teaching staff that the success of a curriculum must ultimately depend.

The out-patient department must always be the key position in the clinical teaching system, as the great training ground for both pupils and teachers, and its efficiency, should be the especial care of the board of studies.

Remembering that the clinical assistants are serving a virtual apprenticeship, and that the hospital staff will be recruited from their numbers, the honorary staff should take great pains to develop their teaching capacity and to provide them with opportunities to practise it.

For the student, his out-patient experience provides his first contact with the ambulatory type of patient that constitutes the great bulk of medical practice, and it is there that he learns the sympathetic handling of patients and to recognize the multiple minor maladjustments and maladies from which more than half of his patients will be found to suffer when he goes out into practice.

He will learn much more if after taking his own notes and practising such skill as he has acquired in the use of his fingers, eyes and ears from his tutorial teaching, he is called upon to support his findings in a Socratic discussion than he will from lecture demonstrations.

Such formal instruction should play but a minor part, and be employed chiefly for emphasizing such aspects as the influence of environment and psychic and dietetic factors in inducing and modifying disease and for developing an appreciation of the important part played by psychology in medical practice.

Care should be taken that some group of students should see every patient seeking advice, and this particularly applies to those minor medical cases so often summarily dealt with by the resident staff and regarded as not of sufficient interest to be referred to the visiting physician.

In the wards the checking over of the case histories and of a certain number of full case commentaries is an important duty, but should be done by competent tutors, and be no part of the responsibility of the honorary physicians. Clinical clerks should, of course, be required to carry out their own investigations of the blood, blood pressure, and the various excretions, and should receive practical instructions in such procedures as the administration of enemata, passing of the stomach tube, administration of hypodermic and intravenous injections, lumbar puncture, and the exploration of serous cavities. To this list nursing should surely be added. A certain amount of instruction in nursing is given in the Sydney school in connexion with the systematic lectures in medicine in the fourth year, but it is hoped to arrange for further instruction in this subject during the final year.

In bedside instructions by the visiting staff, time should not be wasted on the reading of extensive clinical notes, for better results will be obtained by requiring the student to recite from memory the

salient features of the case, and then to maintain his findings and diagnosis in a critical discussion in which the differential diagnosis should play an important part. Other members of the group should be expected to be familiar with cases in their particular clinic, and to be prepared to be drawn into the discussion. Some stress may be laid upon the need for full discussion with a class of the more obscure types of cases before special investigations have been carried out, remembering that it is in this stage that the practitioner will first come in contact with them and be called upon to make a provisional diagnosis. All members of a group should attend *post mortem* examinations connected with the clinic, and the clerk in charge of the case should prepare a report in which the findings are correlated with the clinical signs during life.

Set clinical lectures to the whole class should be limited in number and have an entirely different character from bedside instruction. Subjects should be chosen which give wide scope for the discussion of differential diagnosis, and the lecturer should illustrate freely from his personal experience. It is futile and time-consuming to attempt to demonstrate cases to large classes, and patients presented should serve merely as exhibits to fix the lecture subject in the students' memory.

And now, Sir, I have come to the end, but in case there may be some here disappointed that no special mention has been made of this, the oldest Australian school of medicine, I should like to say in conclusion that the chief incentive in our struggle to improve our Sydney curriculum has been our admiration for the high standard of efficiency in the teaching of clinical medicine that has been attained in the Melbourne Medical School under the guidance and stimulating example of the great clinician whom we honour tonight.

CHRONIC INTESTINAL TOXÆMIA IN CHILDREN.[1]

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THE title of this paper needs a few words of explanation to differentiate it from chronic intestinal indigestion, which is the name given by many leading American pædiatricians to cœliac disease. Most British authorities, however, use the word "indigestion" as synonymous with toxæmia. The designation "indigestion" is unsatisfactory, as it implies local disturbances in the alimentary tract, and tends to divert our attention from the wider and more important basis upon which the debilitated state develops.

The symptoms of the child suffering from chronic intestinal toxæmia, hereafter designated the "intestinal" child,(1) are best considered under two headings. Under the heading of unhealthiness we find something is interfering with the child's growth and nutrition, whereas under the heading of unhappiness we find a definite derangement of the nervous system.

[1] Read at a meeting of the South Australian Branch of the British Medical Association on August 30, 1934.

Unhealthiness.

In discussing the condition of unhealthiness I intend to analyze it under eight symptoms and signs, which are as follows: (i) Appearance of the child; (ii) gastro-intestinal symptoms; (iii) vaso-motor symptoms; (iv) fever; (v) profuse perspiration; (vi) disturbances of sleep; (vii) grinding of the teeth, and picking of the nose; (viii) enuresis.

The Appearance of the Child.

The child is thin and delicate looking and sometimes undersized; its complexion is pale, sallow and muddy, although the mucous membranes may show no signs of anæmia. Its eyes, especially towards evening, are darkly ringed, and the lower lids are baggy. This appearance is characteristic of the complaint and, in marked cases, suggests exhaustion from a spell of debauchery. Especially is it noticeable that the child looks completely tired out: it may feel and behave as though languid and exhausted, but more often it is feverishly active, chiefly in wrongdoing.

Gastro-Intestinal Symptoms.

The Tongue.—The tongue may be fairly clean, but usually is covered with a slight brownish fur, and has a peculiar slimy appearance; it may be indented at the edges by the teeth. This appearance is due to the mucus with which it is covered; for the glands of the mouth are as active in their secretion as those of the other parts of the alimentary tract.

The Appetite.—The appetite is generally poor, except perhaps for breakfast, after a purge, at a party, or on holidays. It, however, may be excessive or fairly normal. It may be so bad that meals are often a burden, and sometimes a horror to the family. Perversions of appetite such as dirt-eating and gnawing of clothes are not uncommon.

The Breath.—The breath may be offensive; but this is usually more typical of the "hepatic" type of dyspepsia.

The Bowels.—The condition of the bowels varies. Constipation is common, though sometimes there is a regular daily action. There may at times be a lienteric type of diarrhœa. The stools are often very offensive and pale coloured; but this is more particularly noted during exacerbations. It is necessary to realize that pallor of the stools is also a characteristic sign of hepatic dyspepsia, which is frequently associated with intestinal toxæmia.

Slime is frequently passed, and it was this that induced Eustace Smith, who was the first to recognize the condition, to call it "mucous disease." It is, however, in my experience by no means constantly present, and if one waits for slime to appear before making a diagnosis, the patient will certainly suffer. Thread worms are not uncommonly present. They may occur temporarily in the excreta of healthy children, yet their continued presence is an indication of an underlying state of the bowel wall, which makes it possible for the worm to establish itself.

Exactly similar clinical states are seen in children whose stools are free from worms, but contain large quantities of mucus.

Abdominal Pains.—Abdominal pains of a paroxysmal character are very frequently complained of. These pains may be merely momentary, or last two or three minutes. Sometimes, however, they are much more severe, and may last half an hour, but seldom longer. They are seated about the umbilicus, and are apt to come on in the early morning before rising from the bed, and are sometimes excited by taking food. They do not, as a rule, cause any feeling of nausea.

Vaso-motor Symptoms.

The "white turns" of faints, as they may be termed, are quite a prominent symptom in many cases; they last a very short time, there is no loss of consciousness, and the child does not fall. However, quite frequently, partly from the occurrence of these turns and partly from the presence of certain cardiac signs and symptoms, such as palpitation, pain in the cardiac region, and dyspnœa, a diagnosis of heart disease is incorrectly made.

Fever.

Fever is present in many of these cases, and may occur as recurrent attacks of pyrexia, or may be more or less continuous. The evening temperature in these latter cases is nearly always raised, reaching 37·8° to 38·3° C. (100° to 101° F.).

Sweating.

Profuse perspiration is a very frequent and characteristic symptom.

The combination of these latter two symptoms not unnaturally adds to the parent's alarm, and often misleads the doctor in making a diagnosis of the presence of tuberculous mesenteric glands; in this he will seldom be correct.

Insomnia.

Disturbance of sleep is a prominent feature. Sleep is often restless and disturbed, and night terrors are common.

Teeth-Grinding and Nose-Picking.

Grinding of the teeth and picking of the nose are often noticed, quite apart from the presence of intestinal worms.

Enuresis.

Many of these children have nocturnal enuresis, which has developed as a symptom of their toxæmia. With an excess of carbohydrate in their diet, the products of digestion take longer than normal to be absorbed and excreted with the urine. Normally at ten years of age, there should be five times the amount of urine excreted during the day than during the night; but in this complaint the amount excreted at night is considerably increased, and more than the bladder can hold, thus accounting for the enuresis.

Unhappiness.

Now let us proceed to consider the symptoms and signs of unhappiness.

The nervous symptoms are often more conspicuous than those of physical ill health, and suggest rather a psychological disorder, resulting in the nervous, spoilt, undisciplined child, unhappy itself, and a cause of unhappiness in others. It is unreasonable, ill-humoured, self-centred, and markedly "negative". In milder cases it is shy and frightened, occasionally spiteful, and on the whole disappointing; but more often it is actively and aggressively unpleasant and frequently complains of headache.

Thus far we have the picture of our familiar friend the "nervous" child. We are able to distinguish this from the "intestinal" child by a study of the physical signs.

Physical Signs.

Besides the characteristic appearance of the child's face, the following signs, which point to the intestinal tract, will assist us in making the correct diagnosis: (i) enlarged abdomen; (ii) the occasional or persistent occurrence of abnormal stools; (iii) the presence of gross indigestion as shown by microscopic or chemical examination of the fæces; (iv) the presence of much indican in the urine.

Enlargement of the abdomen can be easily overlooked by both parents and doctors. A child's abdomen ought not to swell visibly from time to time, nor to diminish rapidly after an action of the bowels.

Diagnosis.

In assisting one to make a correct diagnosis, it is of considerable importance to elicit from the mother an accurate and detailed description of the child's diet. The ordinary general answer a mother gives conveys no accurate information. One should begin with the early morning, find out if the child has fruit or anything before breakfast, ask as to each meal separately, and discover not only what he is given to eat, but what he actually does eat. One should also inquire carefully as to what is eaten between meals.

The "Nervous" Child.

The points of importance in the differential diagnosis have been discussed earlier in the paper. It is wise that any child who is brought to us for marked nervous symptoms and peculiarities should be examined with great care for some possible physical cause, particularly one originating in the intestine, remembering that the nervous symptoms are often so conspicuous that they are likely to mask the less evident intestinal symptoms.

Appendicitis.

In appendicitis the pain is more continuous and frequently associated with vomiting; the tenderness is more definite and more localized, and rigidity is present.

Pulmonary Tuberculosis and Tabes Mesenterica.

The persistent fever, the loss of weight (or at any rate the failure to gain in weight), sweating, and the

child's general condition are all suggestive of tuberculosis. Cough may be present; but its origin is very frequently the throat. Examination generally reveals no evidence suggestive of tuberculosis, but should be very carefully undertaken to exclude this disease. It is necessary to realize that chronic intestinal toxæmia is a very common disorder, and despite the fact that in some cases there is a reaction to the Mantoux test, in my opinion the debility and symptoms are not often due to tuberculous disease. The age period under discussion is also particularly free from mortality from tuberculosis.

Chronic Toxæmia of Septic Tonsils.

In tonsillar sepsis the child tends to be pale rather than sallow, and lacks the particular abdominal symptoms to which attention has been drawn. But it must be remembered that infected tonsils and adenoids tend to keep up the symptoms of intestinal toxæmia in two ways: first, by the production of a chronic naso-pharyngeal catarrh with formation of mucus, which is swallowed; secondly, by contributing to ineffective mastication. It was an English writer who first pointed out that owing to the nasal obstruction, the child pauses during mastication to breathe through the mouth, and swallows insufficiently masticated food.

Cœliac Disease.

There are a few points of assistance in reaching a diagnosis of cœliac disease: growth in height is retarded; flattening and wasting of the buttocks is a suggestive sign. Cœliac children are very seldom constipated, and however little the child may eat, one day, it will not fail to pass a good-sized stool the next. The stools in the classical form are large, pale, offensive and unformed, containing a great excess of fat, chiefly in the form of fatty acids. There is a definite achlorhydria present.

Hepatic Dyspepsia.

The chief clinical characters of hepatic dyspepsia are bad breath and pallor of the stools. There is the history of "episodes" of vomiting, fever, acidosis, and symptoms suggestive of migraine. On investigation, the diet will clearly indicate an over-use of the dairy products, such as milk from the Jersey cow, cream, eggs, and also milk chocolate. On examining the child, however, an enlarged abdomen will not be discovered.

Ætiology.

Turning to the ætiology of this condition, the main prime factor in its causation is an excess of the carbohydrate element in the diet. Eustace Smith was one of the first medical authorities to stress this point. When one comes to verify this aspect from a study of the effect of such a diet on animals, it is interesting to study some of the observations made by McCarrison[2] on monkeys.

The clinical effects as seen in monkeys fed on a diet in which there are deficiency of vitamins, deficiency of suitable protein, and excess of carbohydrate, combined in some cases with an excess of fat, are these: failure of appetite, loathing of food, loss of weight, progressive anæmia and asthenia, failing health of the skin, staring hair, headache, vomiting occasionally, diarrhœa, dysentery, impaired sensation, great muscular weakness, incoordination and paresis.

However remarkable the production of these disorders in monkeys may appear to be, it is even more remarkable to note the rapidity with which they disappear when the deficient and ill-balanced dietary is replaced by one more perfectly proportioned and containing an adequate supply of vitamins. Colitis can be produced by a deficient diet with great regularity in monkeys, and can be cured by the provision of suitable food. The effects of vitamin deficiency are relatively less marked when the food is well balanced. When the protein intake is adequate and in proper proportion to carbohydrates and fats, the onset of symptoms due to lack of vitamins is much longer delayed, and the loss of weight is not excessive. When, on the other hand, deficiency of vitamins is associated with great excess of carbohydrates, the onset of symptoms is more rapid, and the loss of weight is great. The onset of symptoms is more rapid still, and the loss of weight greater, when to the defects above mentioned is added an excess of fats.

To help us study the effect of cereals it is interesting to review a paper by May Mellanby entitled: "The Influence of a Cereal-Free Diet Rich in Vitamin *D* and Calcium on Dental Caries in Children".[3] She showed that dental caries in a group of children who were given a cereal-free diet rich in vitamin *D* and calcium for a period of six months was arrested to a greater extent than in the previous investigation, when cereals were extensively used.

Edward Mellanby[4] gives us some interesting facts as to the effect of different cereals on calcification in bone and teeth. Cereals are outstanding in interfering with the deposition of calcifying salts in bone and teeth. There is a wide difference in this respect. For instance, as far as animal experiments are concerned, oatmeal is the worst of all examined, and white flour interferes least with the calcifying process. The embryo or germ of wheat and maize, and probably of other grains, has this baneful effect more developed than the endosperm. It is at the same time well known that these grain products are far richer in calcium and phosphorus than such a substance as white flour. Thus we have foods which, while they contain a more abundant supply of calcium and phosphorus, may in the absence of sufficient vitamin *D* result in a smaller retention of these elements in the growing bones and teeth.

The other factor, which undoubtedly plays a prominent part in producing the symptoms of the "intestinal" child, is over-fatigue.

An hour's rest in the recumbent position in the middle of the day will often help in a wonderful manner to assist in a cure.

Perhaps the explanation is that the symptoms are partly caused by intestinal stasis. A kink is always accentuated in the upright position, and lying down in the middle of the day breaks the long day in which the trunk is vertical, and allows the loop to empty its contents, whereas in the ordinary routine

the loop would not empty itself until the recumbent position was resumed at night. Many hours of absorption are thus prevented.

Principles of Treatment.

In starting treatment, the parents should be warned that it must be carried out strictly, for some weeks at least, to begin with.

Rest.

It is essential that the child should receive a sufficiency of rest. In many of the severe cases the patient should be put to bed for several weeks; in others the amount of time spent in bed must be materially above the normal for the age.

Diet.

The main principle is careful regulation of the diet, with the exclusion of an excess of carbohydrate, so that a smooth and small residue shall be left in the intestine. This principle should be carried out even though constipation may be increased. Thus oatmeal and coarse breads and all forms of "roughage" are contraindicated, and fresh fruit and vegetables must be taken sparingly. In addition, cooked fats, such as fats of roast or fried food or of rich gravies, frequently disagree, and should be avoided. The following constitutes a fairly characteristic diet.

Breakfast.—Dry crisp toast, buttered cold; rusk, baked bread and milk; a lightly boiled or poached egg, or grilled fish or stewed brains; a glass of milk.

Dinner.—Clear soup (no thick or vegetable soup); baked bread; any simple meat (fish, tripe, rabbit, chicken, chop, steak, liver, beef, mutton, brains); well-cooked and finely minced spinach, cauliflower or marrow, and a little mashed potato; custard, junket, jelly or lemon sponge; and cooked fruits (without pips or skins). Of raw fruits, the juice of orange and grape fruit, and ripe bananas (squashed), may be allowed.

Tea.—Much the same as breakfast. Some form of jelly can be allowed with the toast.

When the motions are pale, milk must be restricted, and should be given either skimmed, or diluted with water. Fluids must not be given with the food, as the temptation to wash down insufficiently masticated food is not resisted. In addition, many of these patients have dilated stomachs; in such cases a dry diet is distinctly beneficial.

Dental caries for similar reasons needs attention. It is necessary in many cases for the dentist to extract these septic carious teeth.

The meals should be restricted to three large meals. "Pieces" between meals must be stopped.

Aperients.

Much depends upon the selection of an aperient that, when given regularly, is efficient yet harmless. The aim should be to produce a stool which is soft but formed, avoiding either a constipated or a watery action. It must be remembered that liquid stools are far more "toxic" than those of solid consistence. It is wise to avoid the use of calomel and paraffin. The former tends to aggravate the catarrhal state of the intestines, while stools full of paraffin ferment readily, and there is marked interference with protein digestion. Phenolphthalein, magnesia and compound liquorice powder can be used quite successfully.

Chief reliance must be placed on the preparation of bile and agar, of which the proprietary "Taxol" tablets may be cited as a pattern.

Medical Treatment.

Nothing is better than the old time-honoured mixture of rhubarb and soda, the dose of rhubarb varying with the condition of the bowels. It may be given continuously at first, and later at intervals, if the tongue becomes coated. When the appetite is poor, *tinctura nucis vomicæ* can be added as a bitter tonic to the mixture. It is wise to avoid the use of iron, cod-liver oil, and malt.

Hygienic Measures.

A cold douche, with suitable precautions, is usually good for these children. Interesting outdoor pursuits are useful; but over-exertion of any kind must be avoided. Complete change of air and scene does probably more good than any other single measure besides the diet. A holiday at the seaside is most beneficial, whereas in the "hepatic" type of dyspepsia the hills air seems preferable.

Conclusion.

I should like to emphasize the exceeding frequency with which this condition occurs in childhood, and the importance of discussing in detail with the parents the matter of the child's diet and the general hygienic principles necessary to restore the "intestinal" child to health.

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(3) May Mellanby and C. L. Pattison: "Remarks on the Influence of Cereal-Free Diet Rich in Vitamin D and Calcium on Dental Caries in Children", *The British Medical Journal*, March 19, 1932, page 507.
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FRACTURE OF THE SHAFT OF THE FEMUR.[1]

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I HAVE no desire to pose as a heaven-sent genius who knows more about the subject than anyone else, but I have taken a more or less intelligent interest in fractures of the shaft of the femur for the past twenty-five years, and perhaps you will all admit that this fracture is very important.

The patient is often the bread-winner and his early return to duty is of advantage to his family, to industry and to the community.

You will find in text books a description of various types of break of the shaft, but in point of

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on September 27, 1934.

fact you can get any displacement. In general, fractures due to direct violence tend to be transverse, and those due to indirect violence to be spiral. If you look at the shaft of this femur you will observe that there is a distinct curve, anterior in direction, with a very slight outward tendency. God put that curve in the thigh bone, and it is our duty to try to preserve it when treating these patients. The two most important deformities to avoid are backward sagging and outward bowing.

I wish to point out that our duty is to get the patient back to work as soon as possible, with function as near to normal as possible, and with a healthy mental outlook. The latter point is often neglected entirely.

At the outset I would say that whilst a perfect X ray result is quite laudable, perfect function can be obtained with an X ray picture which is far from good. Too much attention is given to the X ray appearances and not enough to general principles.

First Aid.

Probably the most important part of the treatment is the first aid. These fractures should be put up at once where the patients lie, a Thomas knee splint (bed pattern) being applied over the clothing, with a bottle knot of strong broad bandage over the boot as a means of extension. The triangular bandage folded into the "narrow bandage" is excellent.

There is tardiness of the ambulance to adopt a method which has been proven the best. It is sixteen years since the war ended, and anybody with any experience knows that the only method of transporting patients with fractures of the thigh is the Thomas splint method. The methods used by the ambulances are antediluvian.

About a year ago one of our own colleagues fell in this building and broke his femur. The ambulance turned up, equipped with old fashioned wooden splints. I told them to "take their timber away" and would not allow them to move the patient without a Thomas splint. Dr. Bullock ran up to his house and got an old Thomas splint, which Dr. Vickers and I applied. The patient got a perfect result, which was due almost entirely to Dr. Bullock's splint. Moreover, he had practically no pain from the moment the splint had been applied.

Next morning Dr. Lynch and I cut off his trousers and, without any anæsthetic except morphine, put the limb up. The position was good already.

Perhaps it would be wise for me to show you the method.

This is any army stretcher with a bar which clamps on to the frame and is used as a suspension bar.

Two men can put the patient at rest in a few minutes. You will usually find the patient lying on his back with the knee flexed and the muscles in spasm. If a medical man be present, the first thing to do is to give a hypodermic injection of morphine. Number 1 then places his two hands under the knee, not roughly, but gently. Muscles are friendly little chaps if you treat them well. Number 1 should then gradually lift and pull downwards. Number 2 quickly applies a bottle knot over the boot—a clove hitch only pulls from one side and is not satisfactory. Number 2 sits at the foot of the patient and gradually leans back without any jerk, and little by little takes the strain

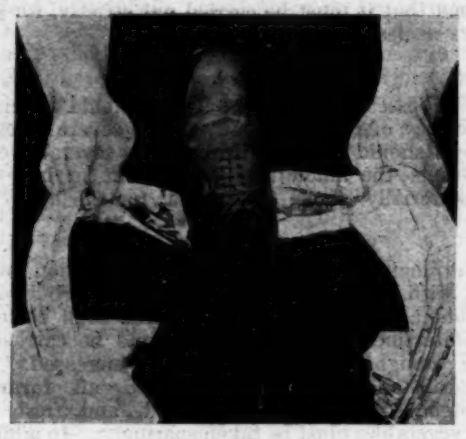

FIGURE I.

Application of bottle knot. Fold an ordinary triangular bandage into a "narrow bandage". Place the narrow bandage into the hollow of the sole of the boot with one-third on the outer side and two-thirds on the inner side. Bring both ends up alongside the leg.

until the limb is straight, when the muscles are under complete control. Number 2 now places the ring of the splint over the foot and gently pushes it up till it is in contact with the *tuber ischii*. The ends of the bottle knot go one under and one over the bar, to be tied at the end of the splint in a

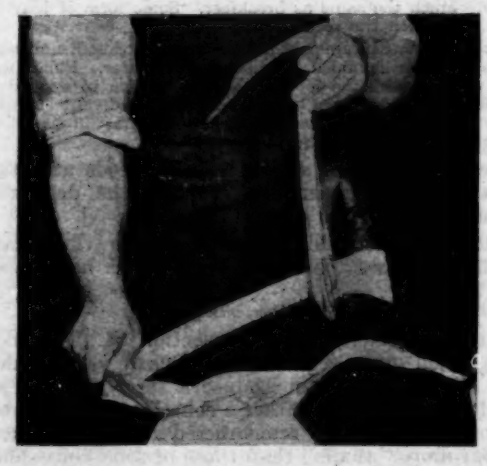

FIGURE II.

Bring the long end across the instep below the short end, which becomes one cord of traction.

reef knot (see Figures I to VI). Strips of basil or strong bandage have already been fixed to the inner bar. The quickest way to fix the strips on to the outer bar is to apply ordinary spring paper clamps.

Now an aluminium gutter splint is placed behind and in front of the thigh and bandaged on, a turn being taken round both bars preferably. A bandage may also be placed round the tibia to steady the limb. The whole splint is then slung from the cross-bar. A patient so treated may be carried any journey without pain or shock.

FIGURE III.
Take the long end round the back of the heel of the boot and loop it through from below (not from above—a common error).

We had exactly the same trouble in Palestine, having indented without success for Thomas's splints. Suddenly, just before the Beersheeba offensive, they arrived in droves. I heard from Henry Wade, of Edinburgh, that Lord Allenby had visited the splint factory at Alexandria—it was his custom

FIGURE IV.
Pull both ends downwards; the knot is applied to the foot over the boot (or shoe). In the photograph the bandage is over the knot of the shoe lace. It would have been wise to have undone the lace to avoid pressure of the lace knot.

to nose round everywhere and to see for himself. He simply said: "Every man with a fracture of the thigh must be sent to base on a Thomas knee splint." He had seen their benefit in France. The result was that the factory worked day and night to carry out his wishes. We need an Allenby in this city.

Any one of you may contradict me, but on the question of first aid I know what I am talking about, as does anybody with war experience.

The first aid splint should not be disturbed on the patient's arrival at hospital, but should be left for about twelve hours. I am persuaded that if all fractures were put on a Thomas splint where the

FIGURE V.
While maintaining continuous traction on both ends of bottle knot, apply the Thomas splint. Bring one end under the side bar and one end over the other bar. Tie the ends firmly in a reef knot in the U slot provided at the end of the splint.

patients had fallen, the surgeons would find the fragments in good position.

To support this contention, I should like to read an extract from the *Bulletin of the American College of Surgeons*, March, 1934, Part 2, page 16:

FIGURE VI.
The knot has been tied. The forefinger is pointing to a piece of stick which has been used as a Spanish windlass to make the traction more taut. One of the paper clips holding the last basil sling is visible in the illustration.

Experience during the World War showed that better results were obtained in those fracture cases that were properly transported, even if over great distances, to where adequate surgical and hospital services could be obtained. Dr. Robert H. Kennedy recommends that a traction splint (ring splint) be applied in all cases in which there "is any possibility of fracture between the hip joint and the foot and between the shoulder joint and

the middle of the forearm". The importance of this recommendation is more fully appreciated when attention is called to the fact that approximately one-third of all fractures involve the long bones of the extremities.

Dr. Kennedy summarizes the advantages of transportation in traction as follows:

"For the patient it decreases danger of further injury, increases comfort and lessens shock.

"For the surgeon it simplifies reduction after the patient's admission to hospital. We rarely see patients in whom there is any overriding of fragments as shown in the X-ray taken on arrival.

"For the hospital as well as the patient it shortens his stay by promoting earlier union and there is less danger of non-union. From the economic viewpoint the expense to industry is diminished because the injured man spends fewer days in the hospital and returns to work more quickly."

The shock associated with these injuries is very great.

At one of the Amman raids, one of our colleagues in the country, who was then a combatant officer, received a gunshot fracture of the thigh. He was put on a Thomas splint by Vance and travelled all the way to Jerusalem, some of the journey on a camel cacolet, the roughest ride imaginable, yet he has an excellent result. At the same time a brave New Zealand officer died at my feet about two minutes after his arrival at Jericho simply because he had travelled with a fracture of the thigh unfixed.

It is no use the ambulances carrying Thomas splints unless everybody is taught to use them enthusiastically and unless an exchange of splints is arranged with all hospitals. At present the first aim of the ambulance is to get back its splint on arrival at hospital, whereas the patient should not be touched in the casualty room, but put quietly to bed and treated for shock and in general be left for about twelve hours.

That this method of first aid is the best amounts to a statement of fact, and I should like our energetic Council to see the first man in the land, even the Prime Minister or Premier if need be, but probably the Minister for Health is the official indicated, and to arrange for the giving of precise orders that every patient with a fracture of the femur be at once treated on a Thomas splint.

An arrangement for exchange of splints with hospitals is just as necessary.

Hospital Treatment.

Now we come to treatment in hospital. I may say at once that here, too, I favour the use of the Thomas bed splint. No doubt there are many ways of treating these patients, and probably the result depends on the surgeon rather than on the method, but the method taught to students should be as simple and as safe as possible.

If any of you are inclined to scoff at the Thomas method, I would remind you that it was introduced by Hugh Owen Thomas and used by his nephew, the late Sir Robert Jones, who put up more fractured femora than the whole lot of you put together, and further, that it was advocated by the most skilled surgeon that this city will ever see, Sir Alexander MacCormick. The fact that it is British is, in my view, no drawback.

The principle is that the limb is kept in fixed and continuous extension between the *tuber ischii* and the end of the splint. The moment you bend the splint or use weights you do away with the mechanical principle propounded by Thomas.

Ordinary extension strapping is used; the cross-pieces should be on the bias and not horizontal. A gutter splint of aluminium is slung behind the thigh by straps independent of the pieces of basil. By adjusting the individual pieces of basil one can prevent sagging, and if the extension be maintained the limb must be in good line. The foot looks after itself and the patient should be made to move his ankle joint right from the first. After two or three weeks he should be encouraged to flick his patella.

When union has occurred—usually in eight weeks—a walking caliper type of Thomas knee splint should be applied. If this is not done, shortening and bowing may be caused by the weight-bearing on the soft callus. The caliper should be worn for about three months at least. At night the caliper can be removed and the bed splint reapplied for a few weeks, when the patient can sleep without any splint, as long as he puts on the caliper before he stands. He should be encouraged to move his knee voluntarily. An ounce of voluntary movement is worth a ton of massage. In fact, massage often seems to do harm by giving the patient a bad mental outlook through thinking too much about the damaged limb. When the patient is in bed, as pointed out by Vance, a pad should be placed behind the knee to prevent over-extension of the joint.

I should like to thank Dr. C. E. Corlette for the stimulus he has given to the interest in these fractures, although I do not approve of his methods altogether. The Schmerz hook method of extension, in my opinion, tends to cause stiffness of the knee. Prolonged immobilization in plaster seems to cause stiffness and bone atrophy. The hook method may give good results in the hands of experts, but is, I think, a dangerous method to teach to everybody. In children it is impossible, owing to danger of injury to epiphyses.

I should like to show you X ray films of two patients.

The first is a spiral fracture, and you see that the position is excellent in both planes. The clinical result was very good.

The second films are of a transverse fracture which is still under treatment. The lateral view is very good, but the antero-posterior shows slight outward bowing. However, knowing the limb, I can confidently predict a good result with a little shortening.

Any of you may see this patient at the Royal Prince Alfred Hospital. The plating of fractures is poor surgery, and the operator who uses plates lacks either surgical common sense or a conscience.

Acknowledgement.

I have to thank Mr. Woodward Smith for taking the excellent photographs.

FRACTURES OF THE SHAFT OF THE FEMUR.[1]

By Lennox G. Teece, M.D., Ch.M. (Sydney), F.R.A.C.S.,
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The whole problem in treatment of fractures of the shaft of the femur is the maintenance of continuous efficient traction. In the vast majority of cases we are dealing with overlapping which has produced shortening, and this condition always demands the application and continual maintenance of traction, not only in the femur, but in other long bones; thus, almost the only matter for consideration or for difference of opinion is the manner in which this traction is to be applied, and the most efficient method of maintaining it.

Are we to use weight traction, or fixed traction? Shall we apply direct skeletal traction by means of hooks, pins, or wires? Or will it suffice to use skin traction applied by means of "Z.O." adhesive, or gauze glued to the limb?

All will agree that the traction is more effective and the care of the patient easier when the limb is suspended. Some would have it that this discussion must resolve itself into a contest between the Thomas splint and the Hodgen's splint, but let me remind you that the Thomas splint need not be exclusively used for purposes of fixed traction applied by means of the skin: it is also a most efficient splint when used in association with weight traction.

The Thomas splint with fixed traction was most extensively and successfully used for treatment of gun-shot fractures of the femur during the Great War, but we must realize at the outset that the problem of such fractures in civilian life is a very different one. In most of these war-time fractures there was extensive shattering of the bone and vast destruction of muscle, and the main problem was the treatment of the accompanying infected wound. As a rule but very little traction was needed to restore alignment and to overcome any shortening that was present. Conditions are very different in a muscular adult with a simple fracture of the femur with marked muscle spasm producing considerable overlap and shortening. In these cases very considerable traction is necessary to overcome this shortening, and fixed traction will invariably fail to do so. The great difficulty in this, the usual method of application of the Thomas splint, is the fit of the ring, which must be extremely accurate. Either delay is caused whilst the splint is made specially to fit the patient, or else an enormous number of splints must be kept in stock to fit thighs of varying dimensions. Nothing less than one hundred splints, fifty each of right and left, would be an adequate supply to have on hand in order to secure the possession of a sufficient variety of different sized rings. The postero-internal portion of the ring of the Thomas splint makes counter pressure against the *tuber ischii*. If the ring be too small, so that the splint will not slip sufficiently far up the thigh, the resulting constriction causes great pain and swelling of the limb. If the ring be too big, the *tuber ischii* will slip down inside the ring, which will then cause pressure against the perineum, causing unbearable pain and the speedy production of a pressure sore. One or other of these unpleasant conditions usually occurs when a Thomas splint is thus employed. Even if we order a special splint to be made, its accurate manufacture requires work of considerable skill and, in practice, the splint has usually to be returned to the mechanic on two or three occasions before the desired fit is secured.

Even with the most accurately fitting ring, fixed traction with a Thomas splint will rarely secure the correction of overlapping in the thigh of muscular adults. Thus we are forced to the conclusion that weight traction is invariably necessary, and for this purpose either the Thomas or the Hodgen's splint may be employed, though the latter is the more popular.

The ease of application and adjustment of the modern form of Hodgen's splint depend largely upon the attachments fitted to it by Dr. Corlette, so much so, that in this city at least the modern version of the splint is usually known by his name. The Thomas splint is equally efficient, except where we desire the thigh much flexed or abducted. In such cases the ring of the splint causes undue pressure in the groin and on the outer side of the thigh respectively. A little more time and trouble are also necessary in suspending the splint.

If the Thomas splint is used for weight traction, skeletal traction may be used, or the cord to which the weight is attached may be tied directly to the end of the splint so that the traction force is applied to the splint in which the limb is fixed.

With regard to the decision between the use of skin traction and skeletal traction, we have to consider efficiency, the patient's comfort, and the danger of possible complications or disadvantages.

As to efficiency, there can be no two opinions. Traction applied direct to the bone obviously must be more effective. With regard to the patient's own comfort, my experience has convinced me that he is infinitely more comfortable with skeletal than with skin traction, more particularly when a heavy weight is employed. However skilfully or carefully the gauze or "Z.O." adhesive be applied to the sides of the limb, the powerful pull that is necessary will cause the traction strips to creep down the sides of the limb, producing abrasions of the skin as they travel, as well as rendering the traction less efficient, and calling for frequent re-application.

The chief disadvantages sometimes urged against the application of skeletal traction are: (i) the danger of infection; (ii) the danger of penetrating the knee joint; and (iii) increased liability to prolonged or permanent stiffness of the knee joint. Cases of serious infection have been reported when a Steinmann's pin has been used to transfix the condyle completely. I have never used this method, and I think its use should be abandoned when other equally effective and non-dangerous methods are available. The infection with the use of a pin admittedly could be a very serious matter. Its use

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on September 27, 1934.

may result in an infected bony tunnel, and, as occurs elsewhere in the body, the infected bony tunnel may result in a permanent sinus.

Schmerz hooks, ice tongs and other similar appliances may all be grouped together, inasmuch as they only penetrate a short distance into the cortex of the bone. Due aseptic precautions must be taken in their insertion. A mild superficial infection sometimes follows their use, but a sinus remaining after their removal has always, in my experience, healed within a few weeks, and never given any serious trouble. In inserting the hooks a preliminary skin incision with a scalpel should not be made, the hooks should be thrust directly through the skin, and a small wisp of cotton wool soaked in friar's balsam should be tucked neatly round the skin opening.

The use of Kirschner's wires has gained favour in some quarters. There is no doubt as to their effectiveness, and in my limited experience I have seen no trouble follow their use, but there must be more danger if any infection occurs when they are employed than is the case with any form of hook. Personally, I think their use is unnecessary in the condyles of the femur, whose natural shape makes them well adapted to the application of hooks. Kirschner's wire should be reserved for use in other areas where the hooks are liable to slip, more particularly, for example, in the tibia.

Böhler favours the application of traction by means of a pin passed through the upper end of the tibia, but if any marked degree of traction is necessary, this method is sure to lead to stretching of the ligaments of the knee joint, with subsequent instability of this joint from which the patient may never fully recover. Undoubtedly, therefore, some form of hook traction is the most useful method to apply to the femur.

For anyone with an elementary knowledge of anatomy there is not the slightest danger of inserting the hooks into the cavity of the knee joint. Cases have occurred, I have seen several myself, in which the hooks have penetrated the knee joint, leading to infection of this joint—a most serious condition. But I am convinced that in these cases the hooks were not primarily inserted into the joint, but gradually dragged down until they entered its cavity, owing to the fact that bad quality hooks deficient in spring were employed. Hooks of the shoddiest manufacture are sometimes offered for sale, and every hook should be carefully examined and tested before purchase. The spring should be so strong that considerable force is necessary to separate the points sufficiently far to span the full width of the thigh momentarily whilst the hook is being inserted. When the sides of the hook can be bent apart by hand in such manner that the points remain separated, the hook is useless, and should be at once discarded. Such a hook, if applied with even moderate traction, might readily drag downwards until its point enters the joint.

The contention that stiffness of the knee joint is more likely to follow the use of skeletal rather than skin traction has no evidence to support it. Delayed restoration of movement in the knee joint is more often due to failure to practise mobilization of this joint at the earliest possible moment.

It is often necessary to apply very considerable weight; the common error is to apply far too little, and in the case of a muscular adult 22·5 or 27·0 kilograms (50 or 60 pounds) weight traction may well be necessary, though after full length of the limb has been gained, this amount can be gradually decreased. Hooks can almost always be removed within thirty days, but after their removal skin traction must be employed. This will be sufficient to maintain the correction which has already been established, though it would not have sufficed to insure this correction in the first instance.

In using the Hodgen's splint the limb must be fixed in the splint by applying strips of "Z.O." on either side of the lower leg, making very light fixed traction, the attached tapes at the ends of the strips of "Z.O." being tied to the bottom of the splint. If this be not done the splint will tend, when suspended, to slip down off the limb. It is always best, also, to suspend the splint to the overhead beam by means of a counter weight approximately equal to the weight of the limb, so that when the patient is raised for the insertion of the bed-pan or other purposes the splint and limb within it will rise simultaneously to an equal degree.

Both the Thomas and the Hodgen's splints should be bent slightly at the knee. This is done for the patient's own comfort, for it is very fatiguing and productive of pain to keep the knee in complete full extension for any considerable period.

In dealing with fractures of the shaft of the femur, it is customary to classify them into fractures of the upper, middle, and lower thirds respectively. Certain points in the treatment of upper third fractures require emphasis, those of the middle and lower third resemble one another more closely.

In the upper third fractures the upper fragment, over which we have no control, is always flexed by the ilio-psoas, and abducted by the glutei muscles. In suspending the limb we automatically also place the lower fragment in line with the upper as regards flexion but, in addition, it must be usually widely abducted. We must, therefore, not forget the basic principle that if we desire to preserve abduction of one lower extremity, we must also abduct the other. If this be not done, the patient will shift in his position so as to lie obliquely across the bed, with the result that a few hours after the application of the splint the limb is no longer abducted. Thus, in these cases we sling the other limb lightly, with a small degree of fixed traction in a Thomas or Hodgen's splint, and also suspend it in full abduction.

The surgical instrument houses usually supply a special many-tailed sling, also the design of Dr. Corlette, with the Hodgen's splint, this sling, of course, being pinned to the side bars of the splint so as to form a trough to support the limb posteriorly. This is the only one of Dr. Corlette's improvements which does not deserve the name. A series of individual slings made of flannel strips 7·5 centimetres (three inches) wide should invariably be used for the posterior support, more particularly in fractures of the lower third of the femur, where there is such

marked tendency to backward sag of the lower fragment. In such cases the sling underneath the site of fracture must be maintained constantly at greater tension than the remaining slings, and this additional support under the site of fracture can be obtained only by using individual slings. Furthermore, if wounds which require dressing be present on the posterior aspect, it is very easy to release one or more of the slings temporarily for this purpose, thus reducing the disturbance of the fracture to a minimum. Usually in fractures of the middle third, always in fractures of the lower third, the distal fragment is displaced backwards, often it is also displaced medially. This backward displacement is maintained by the pull of the gastrocnemius and, thus, in these cases it is advisable to splint the limb with the knee flexed to an angle of about 155°. Frequent use of the tape measure should be made, not only to determine that the limb has been restored to the full length, but also in order to make certain that this reduction has been maintained. It has, in most circles, been the custom to support the foot at right angles to the leg, either by actually suspending the foot or, more commonly, by means of a supporting foot piece which is attached to the side bars of the splint, either to the Thomas or to the Hodgen's. Such a foot piece, however, has often endangered the correction of the shortening by preventing the limb being pulled out to full length, powerful traction merely driving the sole of the foot firmly up against the foot piece. Support of the foot is not necessary, provided either the patient or his surgeon possesses a moderate degree of intelligence. The patient must be made to practise active movements of the foot and ankle from the outset; these movements are quite painless, but if he be lazy or timorous it may be necessary to supervise the carrying out of these movements. If these exercises be performed with daily regularity, there need be no fear of shortening of the *tendo Achillis* and of *equinus* deformity and, in addition, the full mobility of the ankle joint will remain undiminished throughout treatment.

Movement of the knee joint should be commenced within thirty days. The so-called subframe can be attached to the Thomas splint, if this has been employed. This subframe permits movement of the knee, and even if the patient be in a Hodgen's splint, some degree of knee movement can be carried out.

After all splinting has been removed, the period required for the restoration of knee joint movement is extremely variable, depending chiefly upon the temperament of the patient. If he be a man in the prime of life and willing and anxious to regain joint movement by his own efforts, no trouble will be experienced. The most useful method of applying passive movement can be carried out by the patient himself. He sits on the side of the bed with his legs hanging down; one end of a bandage is tied round the ankle, and the bandage is then passed underneath the bed and up over the opposite side, where it is grasped by the patient and pulled upon so as gradually to force flexion of this joint.

Some form of splinting will almost certainly have to be retained for a minimum period of eight weeks. Guidance will be given to some extent by the X ray findings. In these days of the ready availability of X rays for determining the position of fragments and the presence of deformity, too little attention is paid to the use of the tape measure. Both before and after the primary reduction the limb should be measured to determine the degree of shortening, and frequent measurements should be made subsequently throughout the course of treatment. If the external alignment of the limb is quite satisfactory and the tape measure reveals no shortening, a considerable degree of displacement as shown by X rays can often be disregarded.

Except in the treatment of children, walking Thomas caliper splints should invariably be employed in convalescence, and not discarded till six months have elapsed from the time of injury. Some care is necessary in supervising the use of the caliper splint, and the surgeon must not be so easily satisfied as the splint mechanic. A favourite device of the mechanic in order to avoid the trouble of making an accurately fitting ring is to make the splint too short and the ring too large. As the splint is then too short for the ring to press against the perineum, the patient is quite comfortable, and makes no complaint, but the apparatus is then quite inefficient in relieving the femur from weight bearing. The ring of the caliper should be a very close fit, so much so that in putting it on, quite a deal of care and time are necessary to work it snugly up against the *tuber ischii*, which must on no account slip down inside the ring.

There is room for much investigation into the end results of fractured femurs. It is regrettable that general surgeons treating fractured femurs in public hospitals never see the end results. They may see the patients, and follow them up for some few weeks or months after they are discharged from hospital, but we cannot consider the end result as reached until the patient has attained his maximum function possible. In these days when workers' compensation is so intimately connected with industrial injuries, the end results of fractured femurs are being seen, but unfortunately they are being seen by only a few members of the profession, and usually not by the surgeons who have treated them. It would be an excellent thing if, when the time arrives for considering the capacity for work of a man who has sustained a fractured femur, the medical board examining him would make a practice of advising him to submit himself for reexamination by the surgeon who had originally treated him. If every one of us were to see the final results of our fractured femurs, we would be less complacent about the efficiency of our method of treatment.

There will be a considerable number of cases in which, in spite of every effort and in spite of reduction, X rays will still show the persistence of a degree of deformity, and it is of great importance to know exactly how much and what types of deformity can be more or less disregarded. Provided that the general line of the limb be preserved, and that there is no angulation, more particularly angular convexity backwards, a small degree of shortening up to 2·5 centimetres (one inch), or even 3·75 centimetres (one and a half inches) is not incompatible with good function.

If the lower fragment be displaced bodily inwards or outwards in relation to the upper, but they still lie parallel, even though there be no end-to-end contact, excellent function is usually obtained, though of course there is considerable delay in union as compared with a fracture in which end-to-end apposition is secured. Marked angular convexity backwards at the site of fracture leads to a condition as of apparent *genu recurvatum*, and this produces a feeling of instability in the knee joint. The other common deformity of marked lateral angulation, of course, alters the plane of the knee joint, and is prone to be followed by traumatic arthritic changes in this joint.

Delayed union is common, but except in the grossly destructive compound fractures of war injuries, I have never seen a case of true non-union in the femur, and I have never had occasion to operate for this condition. I have known union occupy a period as long as eighteen months. The only mention of plaster of Paris as primary treatment in fractures of the shaft that can be made is one of condemnation. However accurately it be applied, it will not prevent overriding, and except in very thin persons it is also impotent to prevent angulation, more particularly angulation backwards.

I have not used Braun's splint, but it possesses a strong objection that it does not provide for the essential suspension of the limb. When the patient is moved for nursing purposes, there must inevitably be movement of the fragments on one another. I regard suspension as of paramount importance, the amount of counter weight being so adjusted that when the patient is lifted in order to place him on the bed-pan, the limb and the enclosing splint automatically rise to the same extent. It is very rarely that any open operation will be needed in these fractures. It is never necessary when adequate traction is instituted from the outset. It is occasionally necessary when the patient is not seen till the third or fourth week after the injury.

If, in such a case, there be overlapping of the fragments with no end-to-end contact, a large boss of callus has often formed over each fractured end, and when traction is applied these bosses are merely locked firmly against one another, and no amount of force will pull the limb down to full length. In these few late cases operation does become necessary, and in spite of the fact that it is no longer fashionable, I am in favour of the application of a plate, which must be both long and strong. Many surgeons favour the removal of the excess callus and the realignment of the fragment by open operation; they then follow this up by the application of skeletal traction, and treat the case as if it were a fresh fracture.

However, it must be remembered that in such a late case where deformity has existed for several weeks, marked soft tissue structural contraction has taken place, and even though the bones be accurately realigned at the moment of operation, there is a remarkably powerful tendency to the redevelopment of deformity, and this can be prevented only by the application of a most efficient internal splint.

This internal splinting, however, by no means implies that we can afford to discard external splinting, and this latter must be maintained with a degree of efficiency and care equal to that observed in a non-operated case. Intramedullary bone pegs are useless. They are physiologically unsound, delay repair, are of insufficient strength, and usually break. However, operation must be strictly reserved for this small group of cases which I have mentioned. Its frequent employment is unjustifiable and a confession of incompetent knowledge of the principles of splinting, and, worse still, a confession of laziness.

JUVENILE RHEUMATISM.

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IF any apology be needed for bringing before you so commonplace a subject as juvenile rheumatism, I may preface my remarks with the words of Dr. J. F. Poynton:

> The medical profession in the last twenty years has, in the face of great difficulties, made great efforts in preventive medicine. Tuberculosis and venereal diseases have been taken in hand; cancer research is ready to pursue any new light which may appear; infant welfare and the activities of the school medical services are pressing forward. Now surely the time has come to turn to rheumatism, and in particular to acute rheumatism in the young. If ever a medical venture on a large scale was needed in this country, it is the prevention of rheumatic heart disease.

The venture has been undertaken in the country referred to, namely, Great Britain, and also in America, with gratifying results. At a recent meeting of the Federal Council of the British Medical Association in Australia a resolution was received from the Section of Medicine of the Fourth Session of Congress:

> That the Federal Council should consider the advisability of a full and comprehensive inquiry into rheumatism in Australia similar to inquiries that have been conducted in other countries.

After discussion, in which attention was drawn to the difficulty of undertaking such an investigation and the expense connected with it, it was resolved that no further steps could be taken in the matter. One can at least register a note of disappointment in the Council's attitude, but a protest is surely called for in regard to the cavalier statement of one member that "rheumatism in Australia was no different from rheumatism in other countries".

It is not my intention to weary you with a reiteration of the details of ætiology, symptomatology and treatment of juvenile rheumatism, but rather to present a few salient features of the disease for your consideration, and in particular to stress the advisability of a sustained and efficiently supervised convalescence from the acute forms of the disease, and of the thorough investigation and care of the many children who show evidence of rheumatic infection but who have never had acute manifestations.

Prevalence of Juvenile Rheumatism.

During the two years ending June 30, 1934, 118 patients with juvenile rheumatism were admitted to the Royal Alexandra Hospital for Children (see Table I). Ninety of these were children with first attacks of rheumatism and 28 with recurrent attacks. There were 58 girls and 60 boys. The youngest age was three years (two patients). Of the first attacks, 6% occurred before the fifth year and 17% before the sixth year. This list does not, of course, include the numbers of children so commonly seen in routine out-patient work with manifestations of rheumatic infection; further, it is compiled from one metropolitan hospital only and in no way reflects the incidence of the disease in the State. It seems fair to assume that juvenile rheumatism deserves more than passing notice as a possible crippling factor in the child life of the community.

TABLE I.
Prevalence of the Disease.

Total admissions over a period of two years ending June 30, 1934	118
First attacks	90
Recurrent attacks	28
Males	60
Females	58
Age at first attack:	
Youngest (2 patients)	3 years
Eldest	10 years
First attacks before fifth year	6%
First attacks before sixth year	17%

Ætiological Factors.

The consensus of present-day opinion is that the disease is largely due to a streptococcal infection and that the tonsils constitute one of the most important channels through which infection of the system takes place. In the present series the tonsils were present in 76% of the patients with first attacks and in 54% there was an associated tonsillitis or history of previous attacks of tonsillitis. The question of the beneficial effects of tonsillectomy is one in which there is a certain amount of conflicting evidence, and individual cases should be treated on their merits. The common sense attitude would appear to be to remove tonsils which are obviously infected or which have given rise to previous attacks of tonsillitis, as soon as possible after the acute infection has passed. The removal must be thorough and complete. In some instances tonsillectomy appears to have no influence on the course of the disease. In nineteen of the present series attacks of rheumatic fever recurred after tonsillectomy, which had been performed subsequent to the first attack. Associated with the hygiene of the naso-pharynx is the question of dental caries; this was present in a marked degree in 25% of patients with first attacks in the present series.

Heredity is considered to be an important predisposing factor by many observers. A history of rheumatic fever in one or other parent was obtained in 20% of the cases investigated in this series.

Environment plays an important part in the ætiology of juvenile rheumatism. Though it is difficult to separate the factors involved, the disease is more prevalent in the poorer and thickly populated areas. Seventy of the children in this series came from five such districts in Sydney, namely, Leichhardt-Petersham, Glebe-Forest Lodge, Paddington-Surry Hills, Redfern-Alexandria, and Newtown-St. Peters. Of the remainder, a comparatively large number were from the Ryde district on the Parramatta River. There were no patients from country districts.

Cardiac Manifestations.

Every child with rheumatic infection is liable to the danger of cardiac complications and is a potential subject of rheumatic heart disease. When the heart is involved, the endocardium, myocardium and pericardium are all affected in some degree, the condition in reality being a carditis. Physical signs suggesting the occurrence of a carditis are a pulse rate out of proportion to the temperature, an increase in the area of cardiac dulness, and an apical systolic murmur. The lesion most commonly encountered is mitral incompetence. The murmur may be the result of cardiac dilatation or the result of organic valvular disease, constituting the earliest sign of permanent damage to the heart. It may disappear entirely during the course of the disease. If unaccompanied by other cardiac lesions, it is usually of little significance. More interest centres around the diastolic murmur, which is not uncommonly heard at the mitral area in association with the systolic murmur. In eighteen of the present series systolic and diastolic murmurs were noted at the mitral area. In my experience the diastolic murmur in such cases quite commonly occurs early in diastole in the position commonly occupied by the third heart sound sometimes heard at the apex in children. The interpretation of this murmur is open to question as to whether it has the same significance as the mid-diastolic or presystolic murmur indicating developing or existing mitral stenosis. Poynton is of opinion that it is "unwise to jump to the conclusion that it is evidence of mitral stenosis" and considers that it is really due to aortic incompetence, even though its aortic origin is not always evident at the first examination. The following notes illustrate the case in point:

> K.M., seven years of age, was suffering from a second attack of acute rheumatism. On examination the heart was found to be considerably enlarged, particularly to the left. At the apex there was a mitral systolic murmur and also a diastolic murmur immediately after the second sound. At the aortic area there was a faint diastolic murmur, heard more distinctly to the left of the sternum.

The main lesion in this instance was apparently aortic incompetence with an associated large heart, the diastolic murmur at the apex being aortic in origin. The typical murmurs of mitral stenosis were present in only three of the series. Although mitral stenosis may occur early in life (H. B. Day has recorded a case at two years), compared with mitral insufficiency it is a late sequel of rheumatic valvulitis, and it may be stated that it is unusual to find well developed signs of its presence in the first decade of life.

Other Manifestations of Rheumatic Infection.

Apart from acute rheumatism and carditis, rheumatic infection may reveal its presence in a variety of clinical pictures and may be very insidious in its onset and progress. Amongst the more frequent of these manifestations are chorea, recurring attacks of tonsillitis, fleeting pains in muscles and joints, headache, and fatigue. In regard to chorea, mention should be made of the tendency to frequent recurrences in some cases and of the increased likelihood of carditis or other rheumatic manifestations presenting themselves during subsequent attacks. The essentials of treatment of chorea are rest and mental and emotional quiet under favourable hygienic conditions. In the more severe types admission to hospital is advisable. Even in the milder forms, however, some attempt should be made to adhere as nearly as possible to the above principles of treatment, and it is as a rule very unsatisfactory to treat these children as out-patients and mainly by plying them with arsenic. In regard to other manifestations, apart from "growing pains", I find headache and fatigue are most frequent. Epigastric pain is not uncommon. Subcutaneous nodules are comparatively rare in this country.

Convalescent Treatment.

Convalescence from rheumatic fever, a disease in which heart affections are so likely to ensue, must necessarily be prolonged. Particularly is this the case with those children in whom signs of cardiac disease have been present during the acute stage, although it must be remembered that evidence of cardiac involvement may not appear until some time afterwards. It has long been recognized that these children cannot remain in general hospitals for such a prolonged period, and consequently they frequently return to their homes too soon and there is a greater tendency to recurrent attacks and permanent cardiac damage.

For a number of years provision has been made on a large scale in England and America for the efficient care of these children in specially equipped convalescent hospitals. Through the activities of The Smith Family in Sydney it has been possible to make an attempt to establish on a small scale a hospital of similar nature in this city. "Mount Arcadia Recovery Home", which, in its present unfinished state, has been in existence for the past twelve months, is situated at Parramatta North, fifteen miles from the city, at an elevation of four hundred feet and on ten acres of land (see Figure I). The ultimate objective is a unit of fifty beds comprising a ward for boys, a ward for girls, and a central administration block. At present the boys' wing only is built. The ward is of the semi-open pavilion type with folding doors on one side which lead on to a terrace on to which the cots can be wheeled for open air and sunlight (see Figure II).

FIGURE I.

ILLUSTRATIONS TO THE ARTICLE BY DR. GILBERT PHILLIPS.

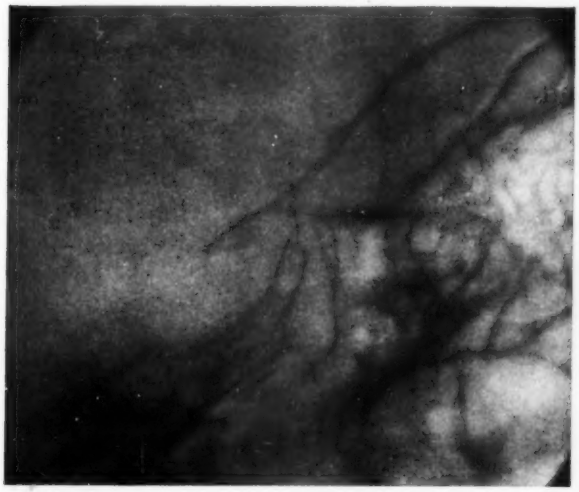

FIGURE II.

Direct radiogram of *sella turcica* showing erosion of floor of the sella and posterior clinoid processes and hyperostoses of anterior clinoid processes.

FIGURE III.

Left lateral radiogram showing *sella turcica* changes and wide venous diploic channels over cranial vault.

The land is under cultivation for fruit and vegetables, and the home has its own dairy herd. The staff consists of two honorary visiting medical officers, an honorary dentist, matron, sister, two probationers, and domestics. Arrangements are being made with the Department of Public Instruction for a part-time teacher.

Types of Patient under Treatment.

The types of patient under treatment are as follow:

1. Children who are convalescent from acute rheumatism.

T.D., aged six years, was seen at the out-patients' department at the Royal Alexandra Hospital for Children. He had never had an attack of acute rheumatism, but for some time previously he had been debilitated, easily tired, subject to headaches and pains in the limbs. While he was under observation at "Mount Arcadia" it was found that he had a mild but persistent pyrexia, a persistently high pulse rate, with a sleeping pulse rate of over one hundred. With routine treatment he gained weight, lost his symptoms, and there was a definite and sustained decrease in the pulse rate, particularly the sleeping rate.

F.C., aged eight years, was admitted from the Rachel Forster Hospital, where he had been under treatment for chorea. On admission there were still slight movements and some cardiac enlargement with an apical systolic murmur. After four months' treatment he had gained 3·15 kilograms (seven pounds) in weight, the cardiac dulness and pulse rate were normal, the murmur was still present, movements were absent, and the sedimentation rate was 7 : 11.

FIGURE II.

A.B., aged seven years, was admitted to "Mount Arcadia" from the Royal Alexandra Hospital for Children, where he had been under treatment for eight weeks for his first attack of acute rheumatism. There was still evidence that his heart had not recovered from the rheumatic infection and that further supervised convalescence was necessary. He was kept in bed for a few more weeks and gradually allowed up and later given graduated exercises. He was five months at the home, during which time he was transferred to the Royal Alexandra Hospital for Children for tonsillectomy and returned to complete his convalescence. He gained 4·5 kilograms (ten pounds) in weight during the five months and on discharge the cardiac dulness was normal, the apical systolic murmur had disappeared, the sleeping pulse rate was 80, the sedimentation rate was 15 : 19, and the results of exercise tests were satisfactory.

2. Children with subacute rheumatic manifestations.

The usual routine is to keep the children in bed for a varying period after admission until it is considered advisable to let them up and have graduated exercises. Decision as to the quiescence of rheumatic infection is based chiefly on clinical findings, particular attention being paid to a careful examination of the heart, the temperature chart, and the sleeping pulse rate. Observations on the effect of graduated exercises on the pulse rate are made as a routine. I am indebted to Dr. Phyllis Anderson, resident pathologist at the Royal Alexandra Hospital for Children, who has kindly

carried out erythrocyte sedimentation rate tests on some of these children. The results are interesting and are appended hereto (Table II) with a comparative list of sedimentation rates on children during a more active stage of the disease. The cases are taken in sequence and are not specially selected. It will be noticed that, with few exceptions, the rates in the convalescent period are definitely lower than those during the more acute stage. The case of A.B. in the former group is of interest. His previous rate had been 15 : 19, and the second rate, which was estimated a fortnight after his return to the home from the Royal Alexandra Hospital for Children, where he had been admitted with bronchitis, was 33 : 42.

TABLE II.

Erythrocyte Sedimentation Rate.

Acute Stage.			Convalescent Stage.		
Patient.	First Hour.	Second Hour.	Patient.	First Hour.	Second Hour.
T.C.	10	28	T.D.	11	23
D.G.	12	26	F.B.	5	17
J.B.	28	52	A.B.	15	19
V.M.	55	63	W.M.	14	24
R.H.	37	47	M.M.	9	19
J.L.	16	33	K.C.	11	24
E.F.	11	50	V.O.	6	14
R.T.	13	32	K.I.	6	16
M.M.	14	34	F.C.	7	17
D.D.	67	70	A.B.	33	42
N.H.	22	42	K.M.	5	24
K.M.	36	55	F.B.	5	22

It has at times been necessary to transfer children from the home to the Royal Alexandra Hospital for Children for tonsillectomy or other treatment. The authorities at this institution have at all times shown a ready cooperation, which has been very helpful and much appreciated.

When the children are discharged from the home the parents are instructed to bring them each month to the medical officers for reexamination.

The average number of children in the home per day for the year was sixteen, and the average stay for each child was one hundred and thirty-eight days. The cost per week per occupied bed was thirty shillings; this has been lessened during recent months with the adjustment of earlier administration difficulties.

During the year some children convalescent from non-tuberculous infection of the lungs, have also been admitted to the home. Although these children have done very well, it is realized that ample provision already exists in other convalescent homes for this type of child. Furthermore, it is generally considered advisable that convalescent rheumatic children, whose activities are naturally limited, should not associate with the comparatively active children who are convalescing from other ailments. For these reasons it is intended that in future only rheumatic children will be admitted to the home.

Conclusions.

Obviously no definite conclusions can be drawn from an enterprise which is only in its infancy as far as this State is concerned. But the results have so far been sufficiently gratifying to stimulate the endeavour to carry the scheme to its completion in the hope that, if successful, it may encourage similar activities in other centres. One feels that, as home conditions are often so intimately concerned with the ætiology of juvenile rheumatism and the persistence of infection, the cooperation of almoners would be of very great assistance. As Poynton has remarked:

> It is not to be expected that this treatment can prevent further attacks should the children return to bad surroundings, but that they improve very greatly is indubitable, and thus are far more likely to escape further attacks and to make permanent recoveries.

Reports of Cases.

MIXED ADENOMA OF THE PITUITARY.[1]

By GILBERT PHILLIPS, M.Sc., M.B., B.S.,
Honorary Neurological Surgeon, Lewisham Hospital; Assistant Lecturer in Surgery, University of Sydney.

THE patient, J.C., a male, aged fifty-three years, was referred to me on April 30, 1934, by Dr. Conrad Blakemore, who had observed bitemporal hemianopia and bilateral primary optic atrophy.

The patient was admitted to the neuro-surgical unit at Lewisham Hospital on May 26, 1934, and the following summary of positive findings indicates his condition at that time.

General and neurological signs of intracranial disease were as follows:

1. Frontal headaches had been present for four years.
2. Gradual depreciation of vision had been occurring for seventeen years. Visual acuity was now $^6/_{18}$ in the right eye and $^6/_{24}$ in the left.
3. Bilateral primary optic atrophy was present.
4. Bitemporal hemianopia (Figure I) was present.
5. On radiological examination erosion of the *sella turcica* and posterior clinoid processes with hyperostosis of the anterior clinoids was found (Figure II).

Signs of endocrine disturbance were as follows:

1. Loss of sexual desire had been noted for five years.
2. The basal metabolic rate was 21% below normal.
3. The patient had a delicate, pale, waxy skin.
4. The patient had square spatulate hands and fingers, with prognathism of the jaw.
5. Radiography showed hyperostoses of the terminal phalanges and diffuse thickening of the cranial vault.

This was obviously a case of pituitary adenoma, and from the nature of the endocrine disturbances, acromegalic appearance of the chromophile adenoma linked to the decreased basal metabolic rate and loss of sexual potency of the chromophobe adenoma, it was diagnosed as a mixed adenoma of the pituitary. Under nitrous oxide and oxygen anæsthesia induced by the intratracheal method a transfrontal exploration was attempted on May 29, 1934. Owing to the huge diploic venous channels in the skull (Figure III) and the consequent risk of exsanguination, this approach was abandoned during the cutting of the bone flap and a transsphenoidal approach was made on June 15, 1934, under local anæsthesia. A submucous resection of the nasal septum with exposure of the vomer was first carried

[1] The patient described herein was shown at a meeting of the New South Wales Branch of the British Medical Association on August 23, 1934.

out by Dr. W. A. Dunn. When this had been completed, the vomer and anterior wall of the sphenoidal sinus were removed. The muco-periosteal lining of the sinus was removed and then the posterior wall was chipped away in the mid-line, the bulging anterior surface of the contents of the *sella turcica* being revealed. A needle was passed into the substance of the tumour, but no cyst formation was found. The tumour itself felt solid and rubbery. As cerebro-spinal fluid commenced to be extravasated at this stage the operation was concluded, a transsphenoidal decompression being left. Convalescence was uneventful, although cerebro-spinal fluid drained away fairly freely for four days.

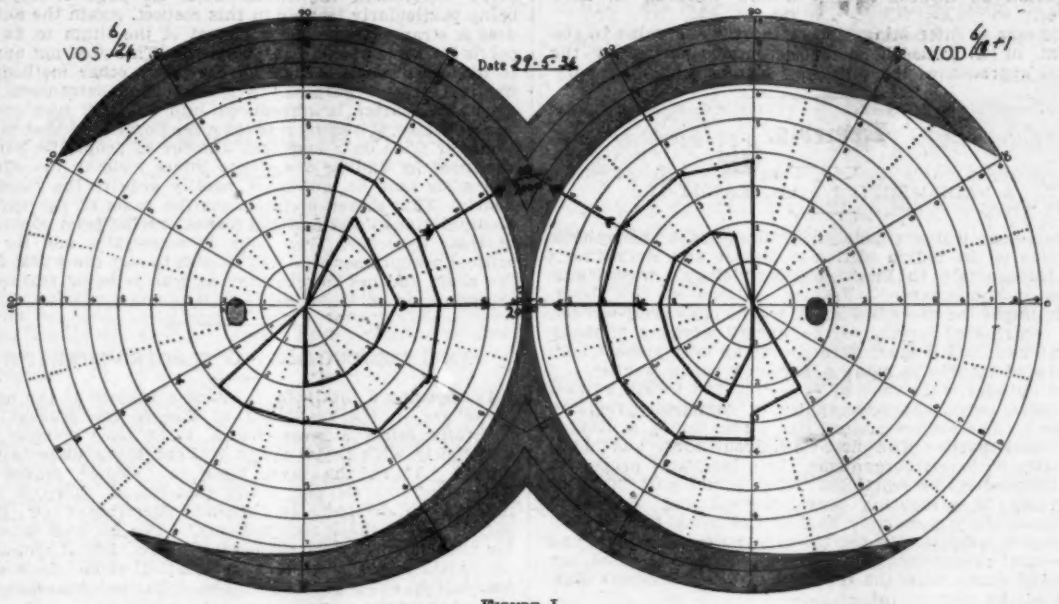

FIGURE I.
Visual fields of J.C. immediately before attempt at transfrontal exploration.

Seven weeks after operation the patient felt very well, had lost all his pre-operative depression, and the visual fields were as shown in Figure IV. Although there had been but little improvement in field extensity, the visual acuity was now $^{6}/_{12}$ in the left eye and $^{6}/_{9}$ in the right eye, demonstrating that the decompression was effective in relieving pressure on the chiasm.

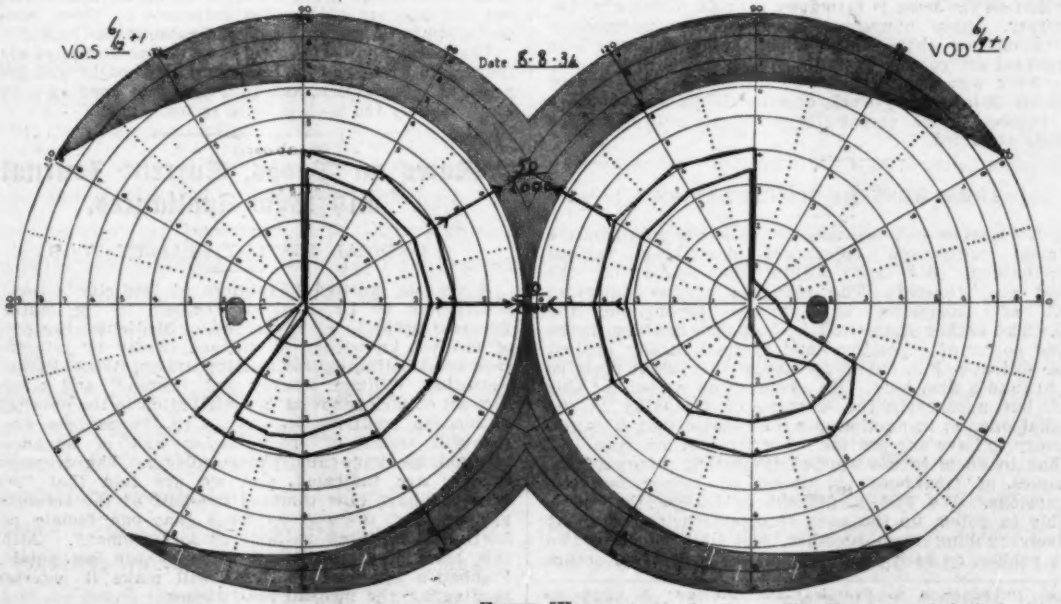

FIGURE IV.
Visual fields seven weeks after transsphenoidal decompression. Note marked improvement in visual acuity.

At the present time the patient feels in excellent health, has no further headaches and says that his vision has improved so much that he has returned to his occupation as a broker and is now working as hard as ever.

This case is interesting since it proves the value to the patient of a transsphenoidal decompression when the frontal approach to the pituitary is impossible.

Reviews.

A VADE-MECUM IN BACTERIOLOGY.

LABORATORY workers generally will extend a sympathetic reception to the fourth edition of Mackie and McCartney's "An Introduction to Practical Bacteriology", which now makes its appearance.[1] Former editions of this book, which might be described as a technician's *vade-mecum*, have contributed largely to the smooth working of many laboratories, and it must have proved an ever present help in time of trouble to many a harassed bench worker.

The authors state that in preparing the fourth edition they have taken the opportunity of completely revising the book. The subject matter, like *omnia Gallia*, is divided into three parts. The first is introductory, and deals generally with microorganisms, their biological properties and immunological reactions. The second part succeeds admirably in presenting bacteriological and serological technique comprehensively and at the same time within reasonable compass. In the third part the pathogenic and commensal microorganisms, not omitting the virsuses, are described along with the methods of bacteriological diagnosis of the various infections.

Although a brief outline of the system of classification and nomenclature of bacteria introduced some years ago by the Society of American Bacteriologists is given in an early part of the book (page 13), the authors adhere to the more familiar terminology throughout.

Illustrations, with the exception of a few essential diagrams, have been omitted, the authors stating their view that as the book is primarily a guide to work in the laboratory, actual apparatus, cultures, and microscopic preparations are there available as the real illustrations of practical instruction.

The book will be searched in vain for the omission of any phase of laboratory work, and the claims of the authors with respect to its essentially practical utility can be cordially endorsed.

TREATMENT BY MANIPULATION.

DR. T. MARLIN has written his book on manipulative treatment with the object of describing various manipulations that are within the scope of the general practitioner.[2] The influence of the American school of osteopaths is apparent throughout the work. The author states that he is a firm believer in the healing power of a healthy hand sympathetically applied to the patient's skin, but in manipulative work it must be able to take a firm hold. He advances no reason for this belief, but apparently the element of sympathy is the essential one, as in another place he states that it is not necessary to have any previous experience of massage. All one has to do is to use applied sympathy. Many of his principles of treatment are based on rather fantastic assumptions. We find it difficult to believe that it is possible to polish up the ends of osteoarthritic bones by passively rubbing them together, just like polishing two rough pebbles on each other, or that the sound that occurs in manipulations of joints is due to the sudden rush of gases into the vacuum fromed when the joint surface has been separated. Many of the methods described do not carry conviction, the illustrations on page twenty-nine being particularly lacking in this respect. Again the author uses a strap placed over the crest of the ilium to fix the pelvis for some of his manipulations. This does not appear to us to be nearly so efficient as many other methods of fixation for this purpose. A good deal of extraneous and debatable matter is introduced into the text and one is not at all surprised to read on page forty-four that if the beginner tries on a sufficient number of people he will be rewarded by finding one whose joints yield to his efforts, and after that he will more readily acquire the requisite knack. This sentence epitomizes the basis of the various manipulations described and leaves one far from convinced of their accuracy. The book is essentially one for the critical practitioner who will be able to sort the wheat from the chaff, and not for the student who is being trained in the scientific principles of the art of manipulation.

[1] "An Introduction to Practical Bacteriology: A Guide to Bacteriological Laboratory Work", by T. J. Mackie, M.D., D.P.H., and J. E. McCartney, M.D., D.Sc.; Fourth Edition; 1934. Edinburgh: E. and S. Livingstone. Crown 8vo., pp. 512.

[2] "Manipulative Treatment for the Medical Practitioner", by T. Marlin, M.D., M.B., Ch.B., D.P.H., R.C.P.S., D.M.R.E.; 1934. London: Edward Arnold. Demy 8vo., pp. 140, with illustrations. Price: 10s. 6d. net.

AN INTRODUCTION TO ELECTRO-THERAPY.

IN choosing a text book for such a subject as the use of electricity in the treatment of disease the student will naturally select a work which is at once reliable and sufficiently wide in its range without being unnecessarily diffuse. If at the same time the author makes his subject of interest and easily understood, there is little more to be desired. In "Medical Electricity" Dr. Hugh Morris fulfils these requirements.[1] The book is intended for the instruction of massage students, but it should be of considerable assistance to medical men desiring a foundation upon which to build a further knowledge of electro-therapy.

In his preface the author writes: "This little book has been evolved gradually as the result of repeated courses of lectures to students preparing for the Medical Examination of the Chartered Society of Massage and Medical Gymnastics . . . It follows closely the present syllabus . . . ." This probably accounts for the fact that there is little reference in the work to diathermy or light treatment; but the absence of detailed reference to those branches of the subject does not lessen the value of the book.

There are numberless works on those forms of electro-therapy to which the work under review might well provide a useful introduction, and as a means of opening a way to further study the book is to be recommended.

Notes on Books, Current Journals and New Appliances.

MEDICAL HISTORY PLAINLY TOLD.

A VOLUME entitled "Frontiers of Medicine"[2] has been contributed by Dr. Maurice Fishbein to "A Century of Progress Series". In "Frontiers of Medicine" the progress of medical knowledge is outlined chiefly by reference to such outstanding figures as Hippocrates, Galen, Paracelsus, Versalius, William Harvey and Pasteur; and a concise account of each innovator's contribution to the development of modern medicine is given. In the modern era, Dr. Fishbein treats of specialization and of advances in internal medicine and pharmacology. The triumphs of surgery are indicated, and we are told that "several surgeons have now removed one-half of the cerebrum of patients and there is evidence that one female patient continued to think as well as any woman". Although this book is primarily intended for the lay public, Dr. Fishbein's lightness of touch will make it entertaining reading for the medical practitioner.

[1] "Medical Electricity for Massage Students", by H. Morris, M.D., D.M.R.E.; 1934. London: J. and A. Churchill. Demy 8vo., pp. 397, with 103 illustrations. Price: 15s. net.

[2] "Frontiers of Medicine", by M. Fishbein, M.D.; 1933. Baltimore: The Williams and Wilkins Company; London: Baillière, Tindall and Cox. Crown 8vo., pp. 217. Price: 5s. net.

The Medical Journal of Australia

SATURDAY, NOVEMBER 24, 1934.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

HUGH OWEN THOMAS.

THE discussion at the recent meeting of the New South Wales Branch of the British Medical Association reported in this issue centred round the use of the Thomas splint. Though considerable difference of opinion was expressed regarding the use of the Thomas splint by the ambulances in Sydney in the transportation of patients suffering from fractures of the femur, there was no difference of opinion concerning the comfort of the patient and the good results that may be obtained by its use. The introduction of the Thomas splint marked a new era in the treatment of fractures of the femur. The discomfort, one might almost say the horrors, of the long Liston splint and its oftentimes unsatisfactory results belong, or should belong, to the past. It needed the Great War, with its well-nigh countless fractures of the femur from gunshot wounds, to teach surgeons the lesson that they had to learn. Those who saw the Thomas splint used in field ambulance and casualty clearing station in France, Palestine and elsewhere, realize more than anyone else can realize what a boon Hugh Owen Thomas gave to the world when he devised his splint. He relieved much intolerable pain, he saved many lives, and he restored useful function to countless broken and shattered limbs. This year, 1934, is the centenary of Thomas's birth—he was born on August 3, 1834—and it will be well, while thinking of his splint, to call to mind what manner of man he was and to reflect on the principles underlying his treatment and on their application.

Hugh Owen Thomas was the son of Evan Thomas, a bone setter, who practised in a suburb of Liverpool, England. He was the eldest of five sons, all of whom became medical practitioners. We have it on the authority of Sir D'Arcy Power that his father, Evan Thomas, was the seventh in linear descent of a family believed by the neighbours to be endowed with a special gift of healing. Some of the members of this family used their gift without fee or reward for the benefit of those around them; the poorer members of the family, like Evan Thomas, accepted money, but their business was not lucrative. Hugh Owen Thomas lived up to the family tradition; he lived and died in Liverpool and was idolized by the poor. Every Sunday morning he held a free clinic for the poor. "When the bells were tolling for church, the surgery at Nelson Street was filling with a congregation of suffering folk." During the remainder of the week a fee was expected and taken. Thomas was a thin, dark, fragile-looking man, well under medium height, but of "indomitable spirit and of unbounded power of application". What Thomas preached more than anything else was rest; he held that rest in the treatment of the disabled body should be "enforced, uninterrupted and prolonged". Sir Arthur Keith classes Thomas with John Hunter and Hilton in this regard. John Hunter, he states, prescribed rest as a routine measure; Hilton elaborated rest into a system; but Thomas made it his creed and ritual. Thomas wrote in 1883: "The crying evil of our art in these times is the fact that much of our surgery is too mechanical, our medical practice too mechanical, and there is a hankering to interfere, which thwarts the inherent tendency to recovery possessed by all persons not actually

dying." He also added in another passage: "There are actions which Nature cannot do so well as the artist in charge." In the present day, when interference is easy and can be undertaken almost with impunity, these words need emphasis. The craftsman may know how, but the artist alone knows when to interfere. Thomas's aim in treatment of fractures, to quote Sir Arthur Keith again, was to secure: (i) perfect fixation of the part to insure absence of friction, (ii) freedom of blood supply, (iii) an attitude of indifference as regards obtaining perfect symmetry. Thomas was a believer in normal volitional movements as opposed to the most skilled manipulations. He once wrote:

> For many years after the commencement of my experience in surgery, I had the opportunity of observing the practice of those who had acquired a good reputation for skill as successful manipulators. Their forcible operations and passive motions were supposed either to lead to, or hasten on, the recovery of joints injured or otherwise unsound. I have resorted to these performances and for many years believed that my interference assisted recovery. Long ago I have, from a more complete knowledge, confirmed by crucial tests, so selected them that I cannot find suitable cases upon which I would perform the deception known as passive motion. And, whereas in the earlier days of my experience I believed that much aid was given to recovery by passive motion, now I know, by well attested facts, that some of my marvels of my past practice had been marred by the very treatment I was so proud of.

Such was Hugh Owen Thomas, the man who handed on to Robert Jones the torch that was to light the way to the development of orthopædic surgery. When surgeons adopt modern treatment in fracture of the femur they are following his footsteps. This is not the occasion for discussion of the advisability of using the Thomas splint in the way that the man who devised it intended. Whether the splint is used in this way or as a Hodgen splint, the general principles laid down by Thomas are being followed. It is platitude to say that it is not the method that counts, but the man behind it. It should also be a platitude that no one should make the method fit the case. This was made quite clear in the Sydney discussion. And in passing we would express satisfaction at the mention of the use, particularly in children, of the method elaborated by the late Robert Hamilton Russell; this method is used all too seldom. Some of the speakers at the Sydney meeting deprecated the teaching of what they called elaborate methods to students. We hold that any method of treating fractures can be mastered by the man who cares to give the time and trouble to the task. If a medical practitioner is not prepared to give time and trouble to mastering what appear to him to be elaborate methods of treatment, he should not undertake the treatment of fractures of the femur. By adjusting a Thomas's splint to the patient's limb *secundum artem* he can have the patient moved with safety to the care of someone more capable than himself. Even if he does nothing more than this, he is allowing the patient to benefit by what Hugh Owen Thomas did for humanity.

Current Comment.

SOCIAL FACTORS IN MEDICAL PRACTICE.

THAT a wise physician is as intimately concerned with the social and economic environment of his patients as with the more strictly clinical aspects of their ailments is a truism. But that George R. Minot should read before the Medical Section of the American Association for the Advancement of Science a paper dealing with the subject of the sociological factors concerned in the correct handling of the sick is provocative.[1] At first sight we would say that a proper appreciation of this side of a medical practitioner's work may be taken for granted, for surely all would agree with the quotation from Parry, of Bath, that it is often more important to know what kind of a patient has a disease than what disease the patient has. But Minot points out that while able young physicians realize the great importance of the social aspects of their cases, and while the general practitioner of former generations readily acquired and aptly applied such knowledge, the practitioner of today is not always so fortunate. The subdivision of medicine into specialties has now arrived in general practice, a trend seen particularly in the arrangement of partnerships today. Moreover, other changes in the social life of the day make it ever harder for the medical practitioner to make close contact with the environmental factors in his patients' lives. Minot remarks that the medical practitioner of today needs much more knowledge of this kind than his predecessor, and he has to put forth more effort to obtain it. He further sagely observes that high grade medical work permits good social work, and that though many failures both in hospital and private practice have been directly due to disturbing elements outside the confines of

[1] *Archives of Internal Medicine*, July, 1934.

conventional practice, many physicians have been slow to recognize this. It is not sufficient for instance, to place the whole responsibility in these matters on the professional social worker; the medical attendant himself should be able and willing to lead and should recognize not only what Minot terms the rhythm of life, with its natural ebb and flow, but also the surging of its conflicting currents.

In order to point the moral, Minot gives several case histories. One of them concerns a woman in good, in fact apparently ideal, circumstances, who had been advised to rest in order to benefit her condition of mild arthritis. It was only when a consultant actually visited her house, and after due inquiry and careful study was able to appreciate the many difficulties in the way of the patient's making a correct interpretation and application of the simple advice tendered, that any benefit accrued to her. In another case a man suffering from duodenal ulcer failed to improve in health until his mode of life was radically changed. This sounds a commonplace, but it was really necessary that his medical attendant should grasp the faults in his patient's business method and remove, in addition, an inhibition in his mind which made him uneasy in the company of those who were by right his social peers. Every medical practitioner of experience can no doubt supply many such instances from his own private store of knowledge and wisdom of this kind, but we may echo the doubt that seems to be in the mind of the author and wonder whether the rising generation of medical practitioners will be so well equipped.

What is the solution? It certainly does not lie within the ruled columns of a set medical curriculum; such knowledge cannot be learned in the abstract. It is important that the clinical teachers of today should realize that sociological wisdom in medicine is in some danger of being forgotten, and it is just as necessary that students should have their attention directed to the environmental factors in disease and its treatment as it is for them to be taught doses of drugs. A patient who was examined at a well known clinic once complained that he was not treated as a human being; probably he had reason. But even to remove this reproach is not enough: we have to try to understand in some fashion not only the complex environment of the patient, but the still more complex mind which through his whole life has been attempting to adjust itself to and integrate itself with the bewildering world in which it moves.

MIGRAINE.

MIGRAINE or hemicrania has been known since the times of Galen and Aretus. The paroxysms may be very severe and entail much suffering. They are usually unilateral and may be associated with hemianopia or scintillating scotoma. Apart from the attacks, the general health may be unaffected. The disease is not dangerous, but a *scotoma scintillans* in the driver of a motor vehicle or in a person walking across a busy thoroughfare may be fraught with peril. Vomiting often terminates a seizure. Attacks tend to become less frequent or to disappear with the advance of years. Influenza sometimes terminates the attacks. There is a distinctly hereditary tendency and migraine is common in arthritic subjects. Migraine in youth may be replaced by asthma or gout in later years. The essential cause is quite unknown, in spite of the commonness of the disorder. Errors of refraction do not seem to be ætiologically important. Intranasal troubles may have some bearing. Duodenal stasis or hepatic derangement has been suggested as a causative factor, and the vomiting of bile when the attack subsides has given rise to the term "bilious headache" for the condition. J. S. Diamond found in most cases an hepatic derangement as estimated by the Van den Bergh reaction. All these cases presented the "latent icteric" stage. High Van den Bergh readings occurred in the attacks and the intervals also. Diamond found the blood pressure consistently low. His opinion was that toxic putrefactive substances reached the circulation from the failure of the liver to detoxicate them, and that the vascular symptoms were anaphylactic. Histamine and tyramine are putrefactive products which are toxic and which induce vascular alterations of vaso-constriction or vaso-dilatation. Döllkin induced migraine by injections of histamine which causes undue capillary permeability. He considers that an attack is due, not to pure vaso-dilatation, but to a different reaction in the arteries, veins, and capillaries, the two former being contracted while the capillaries are dilated. There thus occur excessive exudation of cerebro-spinal fluid and rise of intracranial pressure. The use of vaso-dilator drugs would therefore be indicated. Döllkin's theory does not explain the unilateral nature of the attacks. It is generally held that unilateral, cerebral, and meningeal vascular spasms occur in the attacks, but this does not explain the rarity of such cortical manifestations as fits, aphasia or monoplegia.

S. Brock, M. O'Sullivan and D. Young state that the suggested ætiological factors are allergy, hormonal imbalance, water retention, and instability of the meningeal and cerebral vessels.[1] They investigated the effect of non-sedative drugs in twenty-five persons with long-standing migraine in whom medical, neurological, nasal, and X ray examinations and basal metabolic rate estimations disclosed no abnormality. They found that menstruation was a provocative factor in most of the females. Hypodermic medication was employed. "Follutein" or "Antuitrin S" contains two hormones of the anterior lobe of the pituitary—an ovarian follicle-stimulating hormone (prolan *A*) and a luteinizing hormone (prolan *B*). With this preparation Brock and his colleagues induced typical headache in some females, but not in males. Other workers had found prolan in the urine before and during migrainous attacks and had induced

[1] *The American Journal of the Medical Sciences*, August, 1934.

headache in most of the subjects by "Follutein". E. Földes believed migraine to be due to increased water retention in the meningeal and cerebral tissues. Pitressin is believed to promote water retention in the tissues. Brock and his co-workers failed to produce headache by injecting pitressin and administering forced fluids. Injections of insulin showed that a low blood sugar was not a cause of migraine.

Histamine acts on the vessel wall in a manner opposite to that of adrenaline. It causes a pronounced fall of blood pressure from capillary dilatation. Injected for migraine, histamine was found by Brock to afford no relief. It sometimes intensified the headache and in some cases evoked an attack. Ergotamine is thought to be a vaso-dilator by sympathetic paralysis. Histamine might therefore be expected to help those relieved by ergotamine. But it was found that ergotamine gave relief when histamine failed or when it aggravated the condition. Adrenaline causes a rise of general blood pressure and secondary dilatation of the pial blood vessels in cats and monkeys. We do not know what effect injection of this drug has on the human cerebral circulation. Locally applied to the brain surface it produces some vaso-constriction. In Brock's investigations the results varied. Benefit was seen sometimes only, and aggravation also occurred. When adrenaline failed, and also when ephedrine failed, ergotamine was sometimes effective. Ergotamine paralyses the sympathetic augmenter functions which are stimulated by adrenaline. Ergotamine paralyses both motor and inhibitory endings of the sympathetic. It has been used for migraine for some years and has been of much benefit in sympatheticotonic but not vagotonic patients. In Brock's series many subjects were relieved. If ergotamine failed the first time, it always failed. Acetylcholine or a closely related body is the vagus hormone. It is rapidly disintegrated in the body. The acetylester of β-methyl choline (mecholine) is more stable. Mecholine gave striking relief in a few cases unaffected by ergotamine, but it was not always helpful. Thus measures inducing cerebral vaso-dilatation did not give invariable relief. Amyl nitrite failed more often than it gave relief. Amniotin is the œstrus-producing or ovarian follicular hormone. It is lacking in the urine of female sufferers from migraine. However, it did not give the expected results and in women failed more often than it succeeded. Brock believes that during a migraine attack there is no increase in intracranial pressure. Caffeine decreases intracranial pressure, so no benefit was expected from caffeine and none was found. Calcium also, on the whole, was ineffective. It is adjuvant to the sympathetic and might be expected to aggravate the condition. When it failed to give relief ergotamine often succeeded.

Brock states that in a paroxysmal disorder such as migraine, the ability to induce a headache artificially would be a time-saving factor to the investigator, but in his series no consistent provocative agent was found. "Follutein", histamine and "Amniotin" sometimes succeeded. The diversity of results in the investigation indicates the presence of more than one mechanism in the production of a migrainous headache. Brock considers that vasospasm is not a primary factor, but a secondary effect. His researches are valuable, but they do not bring us appreciably nearer a solution. The investigations of M. Villaret and his colleagues on regional dissociations in blood pressure, discussed in a recent issue, may help an understanding of the mechanism of the headache, but the actual causes are still elusive.

OTOSCLEROSIS.

Of the various forms of aural disease leading to deafness it is probable that otosclerosis has been the subject of the greatest speculation. Occurring in persons otherwise healthy, progressing very slowly, but inevitably, it causes loss of hearing, chiefly by air conduction, and affects particularly the lower tones of the scale. Tinnitus is common and is sometimes severe, and the peculiar phenomenon of paracusis is also frequently seen in characteristic form. It usually happens that the unfortunate sufferers consult many doctors in succession, and indeed not infrequently resort to the non-medical practitioners in a vain effort to stay the progress of their increasing deafness. Albert A. Gray, who has written much on the subject, has recently presented studies of two cases from the histological point of view.[1] One of the patients died of carcinoma of the breast at the age of forty-one years, and the other of Hodgkin's disease at the age of twenty-seven. The deafness had existed for eighteen and thirteen years before death respectively, so that in each case the patient was young and therefore not likely to be the subject of extensive degenerative disease, and also the ear changes had lasted for many years. Gray describes the changes in considerable detail and claims that these two cases support strongly the views already advanced by him. He considers that the essential ætiological factor is a gradually increasing defect in the vasomotor mechanism controlling the nutrition of the whole organ of hearing. He does not consider that the well known bony changes are of primary nature, and points out in support of this that the degree of deafness bears very little relationship to the extent of disease in the bone. He remarks that the disease may have caused very little fixation of the stapes at all, yet the deafness may be of serious grade, and he concludes that the amount of bony damage present depends upon the age of onset rather than upon the actual duration of the disease. It is significant that the part of the temporal end-organ affected is solely that concerned with hearing, for the vestibular apparatus and the semicircular canals are unscathed. Gray's conclusions are, then, that the disease is really one of function and due

[1] *Proceedings of the Royal Society of Medicine*, July, 1934.

to an ischæmia of the nerve structures concerned in the perception of sound. This views explains readily the curious symmetry observed in the bone of each ear when histological studies are carried out, and although parallels might be quoted in other morbid conditions in which symmetrical changes occur, the author's hypothesis fits in very well. He quotes the experiments of Wittmaack, who tied the veins around the *foramen magnum* of fowls and found changes in the bony covering of the labyrinth. As regards the influence of middle ear disease, he believes that this can determine only the first or chief area of organic affection, and suggests further that prolonged nervous strain or exhaustion might tend to precipitate the change in the cochlear nerve or its central projections. Gray refers particularly to the sluggish vasomotor reflex so constantly found in otosclerosis, and also to the improvement sometimes seen after the exhibition of vaso-dilator drugs, such as amyl nitrite. He is also naturally interested in the paradoxical type of case in which some other influence, such as a rush of cold air, effected a transient vasomotor change and therefore a passing improvement in hearing. He even quotes the case of a woman who found that she had inadvertently transgressed her teetotal principles and had drunk a tumbler of beer; the unwonted effect of this was not only to cause flushing and a feeling of distension in the head, but much greater clarity of hearing was also noted for a short time! As the author remarks, it is hard to decide whether endocrine defects, those modern scapegoats, take any part in the causation of otosclerosis; but there is no evidence in favour of the idea, and the victims appear otherwise healthy. Perhaps these considerations do not lead us much farther on the road leading to prevention or cure, but it would be vain to assert this with confidence. It is, however, very interesting to realize that here is quite probably yet another instance of physical disability due to interference with the circulatory mechanism of the body. Disease which is not infective is to a great extent vascular, and no research into the reactions of this all-pervading activity of the human animal, his circulation, can be without profit.

CURARE AND TETANUS.

THERE is truly nothing new under the sun. In 1878 R. Hunter published observations on curare as a remedy for tetanus. Since his time various enthusiasts have used this drug in the treatment of such disorders as hydrophobia, strychnine poisoning, chorea, muscular rigidity from lesions of the pyramidal and extrapyramidal motor systems and tetany as well as tetanus. Such treatment has generally failed and was practically abandoned. Curare is the arrow poison of the South American Indians and is of great interest to the pharmacological student. It paralyses the motor nerve end-organs in striped muscle. But, as supplied, it is of varying strength and has not a uniform composition. Different alkaloids are found in different samples, and the action of curine is quite different from that of curarine. Hence accurate dosage is impossible and discrepant results ensue.

L. Cole[1] resurrects this method of treatment and records two cases of tetanus treated by curare. One patient recovered and the other, a boy of seven years of age, died. Cole has, during the past six years, treated nineteen patients suffering from tetanus. Of these, eleven recovered. He states that curare seemed to reduce the continuous rigidity of the limbs, abdomen and jaw muscles, to diminish reflex excitability, and to lessen the frequency and duration of the spasms. He frankly admits, however, that dosage is a difficult problem and must remain difficult until more is known of the particular actions of the various alkaloids and until standardized preparations are available.

In spite of Cole's eulogy, it would be wise not to anticipate any measure of consistent success with this treatment. To produce the desired result it would be necessary to evoke a pharmacological effect which would be attended by very grave perils of its own.

INTUSSUSCEPTION.

IN the special article on intussusception, by Dr. P. L. Hipsley, appearing in this issue, special attention should be directed to the use of hydrostatic pressure. That this is necessary is shown by a report of 372 cases occurring at the Children's Hospital, Boston.[2] The treatment adopted at this hospital is surgical operation only. Among the results it is recorded that during the last five years sixty patients seen within thirty-six hours of the onset of symptoms have been operated on without mortality. This is a good record, but if irrigation had been used, some of the sixty patients would have escaped with an unopened abdomen. Irrigation would also have found a useful place in the treatment of patients whose symptoms were of longer duration. W. E. Ladd and R. E. Gross, who make the report, refer to the work of Hipsley, but are opposed to all methods of reduction by colonic inflation. They write: "In those clinics in which this type of treatment is employed a considerable number of the cases come to operation because of irreducibility or to make certain that complete reduction has been effected. Operation is therefore necessarily delayed and the child is subjected to a procedure which depletes its narrow margin of reserve." Hipsley insists that hydrostatic pressure should be used in an operating theatre when all preparations have been made for laparotomy. Even if the intussusception is not completely reduced by irrigation, the partial reduction that is effected will cause less shock than results from the handling of tissues within the abdomen. Hydrostatic pressure is effective, but it must be used in the careful and gentle fashion described by Hipsley.

[1] *The Lancet*, September 1, 1934.
[2] *Archives of Surgery*, September, 1934.

Abstracts from Current Medical Literature.

PHYSIOLOGY.

Observations on the Ileo-Caecal Sphincter in an Unæsthetized Human Subject.

H. L. WHITE *et alii* (*American Journal of Physiology*, May, 1934) have made observations on the proximal colon, ileo-caecal sphincter and distal ileum in an unæsthetized human subject aged thirty years. The opportunity to do so was afforded by prolapse of the caecum and several inches of proximal colon following a caecostomy which had been performed a year previously for a very severe colitis. The prolapsed colonic tube was double-walled, with the peritoneal surfaces in apposition, the mucosa of the proximal or outgoing segment to the outside, and the mucosa of the distal segment lining the tube. The colonic tube lay on the abdominal wall to the right of the wound, the everted caecum lay to the left, and the ileo-caecal orifice was plainly seen. A definite reddening of and increased secretion by the mucosa of the proximal colon was always seen immediately the patient started to eat. This reflex vaso-dilatation, extending to the lower part of the alimentary tract immediately on eating, was consistently observed. Graphic records of the movements of the proximal colon, ileo-caecal sphincter and terminal ileum were made. The author concludes that the relaxed sphincter may respond to a peristaltic wave in the distal part of the ileum with an immediate or with a delayed contraction or series of contractions, or it may show no response. The sphincter may show rhythmic activity in the absence of ileac peristalsis. Rhythmic segmentations of the ileum persist during the passage of a peristaltic wave. The wave of peristaltic contraction is not preceded by a wave of inhibition. Many of the peristaltic waves of the terminal part of the ileum die out shortly before reaching the sphincter. The sphincter is consistently relaxed by adrenaline; its activity may be somewhat increased by pilocarpine. Pituitrin consistently produces some increase in activity of the colon and a diminution in tone and rhythmic activity of the ileum; peristalsis of the ileum may be either increased or decreased.

Effect of Muscular Exercise on the Metabolism of Ethyl Alcohol.

E. HYMAN AND A. PALMLÖV (*Skandinavische Archiv für Physiologie*, April, 1934) have investigated the rate of disappearance of ethyl alcohol from the human body during muscular exercise as compared with rest. Their subjects were young, healthy men, from twenty-one to twenty-six years of age, none of whom were habitual consumers of alcohol. In the author's experiments the alcohol was ingested on an empty stomach, mainly in the form of Swedish export spirit of 96% alcohol, diluted with water, or in some cases in the form of "*Brännvin*", or wine. The average dose was about 0·4 to 0·5 gramme per kilogram of body weight. The work was performed for one hour on a bicycle ergometer, according to Krogh. The blood alcohol was estimated by Widmark's micromodification of the method of Nicloux and others. Investigating only the "post resorption" phase (90 to 300 minutes after ingestion), they were able to verify Widmark's statement that the disappearance of ethyl alcohol takes place linearly and proceeds at a rate which is a constant in each subject. They were unable to show any increased rate of disappearance of alcohol during muscular exercise, except for the minute increase in disappearance owing to the forced ventilation ensuing from the exercise.

Formation of the Corpus Luteum.

BERNHARD ZONDEK (*Journal of Physiology*, July, 1934) describes experiments designed to prove that the formation of the *corpus luteum* is dependent on the anterior pituitary lobe and not on the maturing ovum. It is now universally recognized that the gonadotropic anterior pituitary lobe hormone, "prolan", produces ripening of the Graafian follicle, but the question is being discussed as to whether luteinization is caused by the anterior lobe hormone or by a hormone produced in the maturing ovum. By experiments on the ovary of the hibernating bat he shows that *corpora lutea* may be produced by means of prolan, although the ovum is pressed to one side or destroyed. From this it is apparent that the formation of the *corpus luteum* cannot be dependent on the ovum. Direct proof of this is given by experiments on the follicles of mature rabbits from which the ova are withdrawn by aspiration. After the injection of prolan derived from urine of pregnancy such a follicle is converted into a *corpus luteum*. Thus it appears that the gonadotropic hormones of the anterior pituitary lobe effect ripening of the follicle and ovum, follicular rupture, and development of the *corpus luteum*. The ovum plays no part in these hormonic events. On the other hand, after it is fertilized, the ovum assumes a definite significance for the hormonic process. As a rule there follows the persistence of the *corpus luteum*, which must be controlled by a reaction of the fertilized ovum on the anterior lobe of the hypophysis. The great changes in the production of folliculin and prolan following on the fertilization of the ovum are neither conditional to nor consequent upon every fertilization, since they do not occur as a general rule, except in certain animals. The authors confirm their previous statement that the mass excretion of œstrogenic hormone, which has hitherto been determined only in association with a fertilized ovum, can be found also in male horses and zebras, and that the testes of the stallion contain much more œstrogenic hormone than the placenta.

Effect of Sleep on Human Basal Metabolism.

THE average basal metabolism of south Indian women has been shown to be very low—17% compared with Harris-Benedict and Aub-Du Bois standards. A possible explanation of this low metabolic rate is an unusual degree of relaxation. Is the oriental, in the state of repose required for basal metabolic measurements, already in a condition of relaxation as profound as the average westerner achieves only during sleep? If so, will the oriental's metabolic rate be lowered appreciably during sleep, as in that of the westerner? Eleanor D. Mason and Francis G. Benedict (*American Journal of Physiology*, May, 1934) have attempted to answer these questions by measuring the basal metabolism during sleep of seven normal Indian women students, whose waking basal metabolism averaged 20·7% below the Harris-Benedict standards. They used a closed circuit helmet respiration apparatus of the spirometer type, the accuracy of which had been established in the Nutrition Laboratory of the Carnegie Institution of Washington, and also in Madras. Each experiment consisted of several consecutive ten-minute periods. Usually one or two waking periods were secured first, then sleep for as long as time permitted. The subject was then wakened and urged to stay awake for from one to three periods. The order of waking and sleeping varied in different subjects, and the authors remark that the average Indian is able to drop to sleep more readily in a variety of conditions than is the average westerner. Experiments on twenty-one days showed a consistent decrease in oxygen consumption during sleep, averaging 9·8%, varying from 5·8% to 15·5% with depth of sleep. The change is of the same magnitude as has been indicated for westerners. Two western women were measured on eight days under the same conditions, and in corresponding degrees of sleep showed similar changes. These data confirm earlier evidence that south Indian women have a very low basal metabolism when awake, and the authors consider that they have shown that the state of relaxation is not a causal factor in this low metabolism.

Carbohydrate Metabolism of the Heart following Coronary Occlusion.

H. E. HIMWICH, W. GOLDFARB AND L. H. NAHUM (*American Journal of Physiology*, September 1, 1934) have published observations made on thirty-four dogs during experimental coronary occlusion. The animals were anæsthetized with "Sodium amytal", and then, under artificial respiration,

the sternum was split, exposing the heart. A ligature was passed around a branch of the left anterior descending coronary artery. After the artery was ligated an area of varying size became purple in colour and in some instances ceased to contract. The ligature was maintained for periods varying from five minutes to one hour. At the termination of the experiment the infarcted area and a portion of the normal myocardium were excised, plunged into chilled alcohol directly, or first into liquid air and then into chilled alcohol, in order to make possible the estimation of the amount of lactic acid, soluble carbohydrate and glycogen present. It was found that the infarcted area lost appreciable quantities of its glycogen, which appeared in part as increased amounts of soluble carbohydrates and lactic acid. In most cases, before occlusion, the heart removed lactic acid from the blood stream. After the coronary artery was ligated the heart usually added lactic acid to the blood stream. The increased lactic acid production by the heart was probably due to a diminution of the oxygen supplied to the cardiac tissues. Glucose was absorbed from the blood both before and after the coronary occlusion. It is suggested that the accumulation of products of metabolism in the infarcted area may be related to the subjective pain experienced during coronary occlusion.

BIOLOGICAL CHEMISTRY.

Alkali Reserve and Fat Content of the Blood.

ROBERTSON F. OGILVIE (*Edinburgh Medical Journal*, July, 1934) discusses the mechanism of fat mobilization. While investigating the pathological changes induced by corrosive sublimate he observed that the lipæmia produced in rabbits by this poison was associated with an acidosis. This observation led him to investigate the hypothesis of Stewart, Gaddie and Dunlop, who showed that a lipæmia was associated with a lowered alkali reserve during muscular exercise, and suggested that the acidosis might be the mechanism whereby the depôt fat was mobilized. For this purpose he observed the effect on the blood fat of states of acidosis and alkalosis produced artificially in rabbits by means of ammonium chloride and sodium bicarbonate. The alkali reserve was measured in terms of the carbon dioxide combining power of the blood, and the total blood fat was determined by the method of Stewart, Gaddie and Dunlop. Definite changes were produced in the reserve alkali of the blood, but no alteration was detected in the fat content. He concludes that in rabbits the acid-base balance of the blood does not exert any controlling influence over the fat content of the blood. If these findings are applicable to the human subject, it can only be concluded that during muscular exercise the rise in the fat content of the blood and the fall in alkali reserve are two associated but independent phenomena.

Parathyreoid Glands and Vitamin D.

RUSSELL M. WILDER, GEORGE M. HIGGINS AND CHARLES SHEARD (*Annals of Internal Medicine*, March, 1934) report the results of their attempt to correlate the size of the parathyreoid glands and the vitamin *D* content of the diet. Experiments with chicks reveal that deprivation of vitamin *D*, insufficient in degree to cause rickets, will produce hypertrophy and hyperplasia of the parathyreoid glands. Experiments also show that the parenteral administration of parathormone in such minor degrees of vitamin *D* deprivation prevents the changes in the parathyreoids, but that when the deprivation of vitamin *D* is extreme, so that rickets is clearly in evidence, administration of parathormone may restrict, but will not prevent, the hypertrophy and hyperplasia of the parathyreoids. Other observations are interpreted to mean that the supply of parathyreoid hormone determines the sensitivity of the organism to the action of vitamin *D*. A diminished supply of the hormone diminishes the ability of the organism to function normally with restricted amounts of vitamin *D*; an augmented supply conditions the tissues of the organism so that the effects of the vitamin are more intense and so that amounts of the vitamin which otherwise would not prevent rickets do prevent rickets.

Glucose Tolerance and the Glycogen Storage Capacity of the Dog.

WINFIELD L. BUTCH (*American Journal of Physiology*, June, 1934) has investigated the length of time over which an animal can assimilate glucose at its maximal rate, and the maximal amount of carbohydrate that can be stored under definite conditions. When this maximum has been reached it remains to be determined what will be the glycogen content of the liver and muscles and whether there will be a decrease in the tolerance for glucose at this time. The data presented apply, of course, only to the conditions under which the experiments were done. The subjects were healthy bitches which had been on a standard kennel ration of dog biscuits, a mixture of cooked meat and cereal and ground horse meat; food was withdrawn for twenty-four hours before an experiment, but water was permitted. Dextrose in 10% solution was administered intravenously by continuous injection. Each of four dogs was given three grammes of dextrose per kilogram of body weight per hour. The blood sugar remained at a level of from 0·30% to 0·40%, with a urinary excretion of from 0·50 to 0·80 grammes of sugar per kilogram of body weight for from 36 to 51 hours, at the end of which time there was an abrupt loss of the previous tolerance. The blood sugar rose to 0·7% or 0·8%, and the urinary excretion rose. At this stage, and under "Sodium amytal" narcosis, samples of liver and muscle were removed for glycogen estimation. The glycogen content of the liver was found to be from 20% to 22%, while that of the muscle varied from 2·2% to 4·0%. In a second experiment each of the dogs was given 5·0 grammes of dextrose per kilogram of body weight per hour. The blood sugar rose steadily until it reached 0·7% to 0·8% in ten hours. The urinary sugar varied between 1·0 to 1·8 grammes per kilogram of body weight per hour. The liver and muscle of these dogs at the end of eleven or twelve hours had a glycogen content of 20% and 2·5% to 3·5% respectively. With the rate of injection at 3·0 grammes per kilogram per hour the value of serum phosphate decreased to a trace, but recovered its original value at the end of twelve hours. These results show that the tolerance of a dog to intravenously injected glucose comes to an end if the injection is continued long enough. The point at which tolerance is broken corrresponds to the maximal capacity of the animal for storage, for if the injection be continued the values are not increased. The time necessary to reach this maximal capacity is decreased by increasing the rate of administration of glucose.

Beryllium Rickets.

HUBERT DAVENPORT KAY AND DOROTHY IRENE SKILL (*Biochemical Journal*, Volume XXVIII, Number 4, 1934) have recorded experiments that show that beryllium rickets, which invariably results when young rats are given the normal stock diet to which 0·5% of beryllium carbonate has been added, can be prevented if, at the same time that the beryllium is being fed, a relatively small daily quantity of sodium glycerophosphate is administered parenterally. These results add further support to the view that beryllium rickets is mainly or possibly entirely due to defect of absorption of phosphate from the gut. Animals with beryllium rickets put on to a normal diet without beryllium were found to recover very rapidly. One of the first changes to be observed was an increase in the phosphoric ester content of the erythrocytes and of the liver. The authors also consider that their results prove that fluoride poisoning is not concerned in the phenomena of beryllium rickets.

Calciferol and the Increased Calcium Excretion Induced by Thyroxin.

LEONARD IRVING PUGSLEY AND EVELYN ANDERSON (*Biochemical Journal*, Volume XXVIII, Number 4, 1934) have shown that the intraperitoneal injection of 0·2 milligramme of thyroxin daily into adult rats leads to a definite increase in the excretion of calcium in the fæces and the establishment of a negative calcium balance. The administration by mouth of 5,000 international units of calciferol daily to these rats was found to reduce the fæcal excretion of calcium and to correct the negative calcium balance.

Special Articles on Treatment.

(Contributed by request.)

XLIII.

TREATMENT OF INTUSSUSCEPTION.

AN intussusception, like a hernia, should be reduced as soon as possible, because the longer its duration, the more difficult it is to reduce. Reduction can be effected either by manipulation after opening the abdomen or by using hydrostatic pressure from within the bowel by means of saline solution injected *per rectum*.

If an intussusception can be satisfactorily and safely reduced by the latter method, then an open operation is obviously unnecessary. After using hydrostatic pressure in a series of over two hundred patients, I found that 60% can be completely reduced, and in over 40% it is possible by carefully observing certain signs to be quite sure that reduction has been effected. This method, however, should be used only after the necessary preparation has been made for an open operation. The skin of the child should be prepared beforehand, the surgeon should use sterile gloves, and the injection should be given in a room adjoining the operating theatre, so that no time is lost, if an operation is decided on, after the injection treatment has been tried. The variety of intussusception makes no difference in the selection of the method of treatment to be used, although the enteric and ileo-colic varieties are more difficult to reduce by hydrostatic pressure than the ileo-caecal and colic.

One cannot, however, diagnose the variety beforehand, and in all cases the use of hydrostatic pressure will reduce the greater part of the trouble and so make a subsequent open operation easier and safer.

The Use of Hydrostatic Pressure.

The child is placed under a general anæsthetic before the injection is given. One must on no account use a Higginson's syringe for the injection of the saline solution, as it is impossible to gauge the pressure of the fluid by this means. A definite pressure is obtained by using a column of water of a certain height, namely, three feet six inches. One can use an ordinary douche can for the purpose, although it is better to use a glass vessel, where the upper level of the column of water can be readily observed, and this must be not more than three feet six inches above the level of the table on which the child is lying. A few feet of rubber tubing and a number fifteen rubber catheter are connected with the glass container and the catheter is inserted into the rectum for about two or three inches. The buttocks are pinched together around the catheter, so that no fluid can escape during the injection. It is important not to use vaseline or any other lubricant on the catheter, as it is more difficult to hold it in the rectum if the buttocks are slippery.

After seeing that all the air has been expelled from the apparatus, the saline solution is allowed to run into the bowel, and as it runs in the intussusception gradually yields. After about two minutes the catheter is disconnected and the saline solution is allowed to return into a bed pan. Then a second injection, and after this usually a third, is given, the whole process taking about ten minutes. The first return usually contains much blood and mucus. The second is clearer and may contain a few specks of yellow fæcal material, and the third more fæces and perhaps flatus, both facts indicating a probable reduction. The actual diagnosis of reduction, however, depends on the fact that some of the saline solution has passed through the ileo-caecal sphincter and so distended the small intestine; and in so doing it produces a very decided distension of the abdomen.

Intussusceptions do not as a rule cause distension of the abdomen unless they have been present for a considerable time, usually for over twenty-four or forty-eight hours, so that it is generally quite easy to palpate the tumour when the child is first seen. In most cases the abdomen is quite soft and flaccid before treatment. After treatment by hydrostatic pressure, when the saline solution has entered the small bowel, the abdomen becomes distended; and the difference between the relaxed abdomen before treatment and the distended abdomen after reduction is quite obvious on inspection and more so on palpation. So that when a tumour can be readily palpated before treatment and then, after the injection has been given, the abdomen becomes so distended that it would be quite impossible to palpate a tumour if one were present, we can be quite certain that the intussusception has been completely reduced.

There are cases, however, in which the intussusception has been completely reduced by the injection, but for some reason very little saline solution has passed through the ileo-caecal sphincter; and in such cases the abdomen remains soft and flaccid after the treatment. On palpation one can usually feel the thickened and œdematous ileo-caecal region which previously formed part of the intussusception; and, as it is quite impossible to distinguish between a small unreduced portion of an intussusception and the œdematous bowel of a reduced one, it is necessary in these cases to open the abdomen to determine whether any portion of the intussusception has not been reduced. In a series of 100 cases I found that 62 were reduced by the injection, and I had to operate on 18 of these to make quite sure. The operation to verify reduction is done through a lateral gridiron incision, similar to that usually used for the removal of an appendix. Although distension of the abdomen is a perfectly reliable sign of reduction, provided there was no distension of the abdomen beforehand, it is sometimes a good plan to leave a teaspoonful of powdered charcoal in the stomach of the child before it leaves the table, and this can be recovered by an enema four or five hours later, when the intussusception has been reduced.

The measurement of the circumference of the abdomen before and after reduction is also a useful guide, but the circumference will be increased even with a partial reduction.

Reduction can be produced by using a fluid opaque to X rays, and the actual unfolding of the intussusception can be observed on the screen, but this method has no advantages over that described above. Now, although hydrostatic pressure is invaluable for the majority of cases seen, there are patients whose intussusception has been present for several days, and in these the abdomen is usually distended when the child is first seen. In such cases it is usually impossible to palpate the tumour. In these one should not use hydrostatic pressure with a view to bringing about complete reduction, but as a preliminary to operative treatment. One injection only should be given, a few minutes being taken; no attempt is made to palpate the tumour afterwards, and the laparotomy immediately follows the one injection.

The long duration of the complaint is not always a contraindication to the use of hydrostatic pressure, because there are cases in which an intussusception has been causing symptoms over a period of several weeks, either undergoing spontaneous reduction at intervals, or at any rate never causing complete obstruction. An injection will usually reduce such intussusceptions, but operation is advisable, as it is necessary to do an operation in order that a recurrence may be prevented.

Operative Treatment.

In the following conditions an open operation will be necessary:

1. When there is no definite proof that complete reduction has been effected, as where the thick œdematous ileo-caecal region of the bowel can still be felt after the injection treatment.
2. When the partially reduced intussusception can be palpated after treatment.
3. In long standing cases in which it is difficult or impossible to feel the tumour either before or after treatment.
4. In cases in which the intussusception has recurred.
5. In the subacute and chronic cases which usually occur in older children or adults, where a polypus may have been

the cause or where the intussusception may have started in the appendix.

A mid-line or paramedian incision, about three and a half inches long and with the umbilicus about the centre, should be used in all cases in which it may be necessary to explore the abdomen, as where a preliminary injection has not been used and one is not sure of the extent of the bowel involved. The disadvantage of this incision is that the small bowel is apt to prolapse through the wound during the operation, and so adds to its difficulties and risks. This incision also is more difficult to close without omentum or even small bowel becoming adherent to the peritoneum after closure. Intestinal obstruction may occur from such an occurrence either soon after operation or maybe some years later.

A right muscle-splitting or so-called gridiron incision, similar to that commonly used for the removal of an appendix, can be used in the majority of cases. It is the best incision to use when only a small portion of the intussusception remains unreduced. The opening in the peritoneum need only be large enough to admit two fingers. An intussusception several inches long can be dealt with through this incision and if it should be necessary to resect the bowel or to perform ileostomy, this can be done with less risk of soiling the peritoneal cavity.

After opening the abdomen the tumour is located, and if a preliminary injection has not been used, then it is advisable to try to reduce as much as possible of the intussusception inside the abdomen. Even if the tumour be withdrawn from the abdominal cavity it is generally necessary to return it whilst reducing the portions in the splenic and hepatic flexures. If, however, hydrostatic pressure has been used beforehand, then the small unreduced portion can be more easily dealt with. The actual reduction is effected by squeezing the tumour so as to force the intussusceptum from the intussuscipiens. This is generally easy at first, but in long-standing cases the bowel wall becomes so œdematous that further reduction becomes difficult or impossible, and continued attempts at reduction only result in tearing of the bowel wall; first the peritoneal coat gives way and then the muscular and mucous coats. Reduction is sometimes rendered possible by enclosing the tumour in a warm, moist sponge and keeping up manual pressure for a few minutes. Gently dilating the neck of the intussusception by inserting a finger through it alongside the entering layer will also help reduction. Although efforts at reduction by attempting to pull the intussusceptum from the intussuscipiens are usually not advisable, the last portion may have to be reduced in this manner, especially the last portion of the ileo-colic varieties. If the peritoneal coat has been torn, it is necessary to suture it with fine catgut before closing the abdomen.

Treatment when Reduction is Impossible.

There are several methods of dealing with cases in which reduction is impossible.

1. Resection of the unreduced portion followed by a lateral anastomosis between ileum and colon. Numerous results of this procedure have been reported, although the mortality is very high in infants under the age of twelve months. If the operation is to be successful it must be done quickly and before a too prolonged attempt has been made at reduction by manual pressure. It is therefore difficult to decide just when to discontinue attempts at reduction to insure a safe resection. Many intussusceptions have no doubt been resected successfully which would have yielded to a more prolonged effort at manual reduction, and many patients have been lost by a too prolonged attempt at reduction followed by extensive tearing of the bowel wall before doing the resection. It is well to remember that the bowel wall is seldom actually gangrenous, even when a resection has been done.

2. Lateral anastomosis, leaving the unreduced portion *in situ*. A number of cases have been reported in which this procedure has proved successful, and it is well worth a trial when it is obvious that the infant will not stand resection. Probably in these cases, as the bowel wall is not actually gangrenous, the operation is followed by a disappearance of the œdema and spontaneous reduction of the intussusception as the general condition of the child improves.

3. Resection followed by temporary enterostomy. There are two methods of performing enterostomy: (*a*) The intussusception is excised and Paul's tubes are inserted into the open ends of the bowel. (*b*) The tumour is withdrawn from the abdomen and the ileum on the proximal and the colon on the distal side of the tumour are sutured together for a few inches. The parietal peritoneum is stitched snugly around the sutured portions of ileum and colon, and the intussusception is then excised. If the child recovers, the spur between ileum and colon can be destroyed subsequently by means of an enterotome. This is similar to the method employed by Devine in his transverse colostomy operation.

4. Temporary enterostomy and retention of intussusception. A catheter is inserted into the small bowel on the proximal side of the unreduced portion of the intussusception, which is left inside the abdomen. The catheter is inserted by the Coffey method, so as to give it an oblique passage through the bowel wall. The child is relieved of the intestinal obstruction temporarily, and if its condition improves the unreduced intussusception can be resected later by excision followed by lateral anastomosis.

Treatment of Recurrent Intussusception.

In a small percentage of cases intussusception has a tendency to recur. I have seen as many as five recurrences in one patient. To prevent such recurrences it is necessary to open the abdomen and after removing the appendix to fix the *caput caeci* to the parietal peritoneum low down in the right iliac fossa. Usually in these cases, as indeed in most intussusceptions, there is a persistence of the primitive mesocolon, and a recurrence may be prevented by shortening this in the manner recommended for dealing with a mobile ascending colon.

Treatment of Intussusception of the Appendix.

Intussusception of the appendix is usually subacute or chronic and may not cause complete obstruction for days or weeks. As a rule the appendix and portion of the caecal wall are so œdematous that it is impossible to evert them, or else they are actually gangrenous, so it becomes necessary to excise the appendix together with portion of the wall of the caecum. The caecum can then be sutured again or, if the wall seems too friable to suture securely, a small rubber tube can be stitched in and brought out through a stab wound low down in the right iliac region. The fæcal fistula resulting will generally close without trouble soon after the tube is removed.

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British Medical Association News.

SCIENTIFIC.

A MEETING OF THE SOUTH AUSTRALIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Anatomy Theatre, the University of Adelaide, on August 30, 1934, DR. L. C. E. LINDON, the President, in the chair.

Intestinal Toxæmia.

On behalf of DR. F. N. LE MESSURIER, DR. E. BRITTEN JONES read a paper entitled: "Chronic Intestinal Toxæmia in Children" (see page 672).

DR. FRANK BEARE, in opening the discussion, expressed his sympathy with Dr. Le Messurier, who had been unable to read his paper owing to illness. He thanked Dr. E. Britten Jones for the able way in which he had dealt with the difficult task of reading the paper at such short

notice. He was sure that the meeting agreed with him when he said that Dr. Le Messurier had done a great service in bringing the subject of the meeting's discussion before the members of the Branch. When asked to open the discussion he had consulted the newer works on diseases of children and had been surprised to find that very little mention was now made of the condition. It was in the older text books that one found reference to the subject in keeping with its importance. No one would disagree with the importance and the frequency of occurrence of the symptom complex. In practice patients suffering from the condition were themselves difficult to deal with, as were the parents. The miserable existence spent by these children reacted upon all that came in contact with them to a striking degree and led to much unhappiness. Robert Hutchison had written and taught a great deal about the "mucous disease", as he called it. Dr. Beare could add little to the symptomatology of the disease, so well described by Dr. Le Messurier. Nevertheless he thought that the tongue was characteristically affected, and in three more common ways. First, a "geographical tongue" was often seen, in which the organ was denuded of epithelium in areas, so that it presented on its surface patterns similar to a map; secondly, a heavily furred tongue with the enlarged papillæ standing out through the furring; thirdly, a glazed tongue with the appearance as if the part had been smeared with "Sticktite" or some similar gum.

Very often the presenting symptom was such that there was a likelihood of the main condition being overlooked if one was not on the alert. The presence of threadworms was one, for these creatures were found remarkably often in children suffering from this disease. Secondly, bad chilblains, with functional albuminuria and a low diastolic blood pressure, were often seen, and the chilblains constituted the chief complaint for which the child was taken to the doctor. Thirdly, he would add that often the child would be classed as a "difficult" one and disciplinary measures suggested by the friends who had failed to recognize the underlying organic condition. Finally, appendicitis might be suggested by the attacks of abdominal discomfort. It was the pathology of the condition that lent itself most easily to discussion. The morbid anatomy was not at all helpful; for little, if anything, was found at autopsy on the rare occasions on which death occurred.

He had been struck by the resemblance these cases bore to the "chronic carbohydrate dyspepsia" described by Hurst, and he suggested that this condition in adults was possibly of the same nature as the disease under discussion. After all, the principles of pathology in children were similar to those in adults, and he deprecated the tendency to establish a pathology of children. The digestion of starch, as was well known, began by the action of the ptyalin of the saliva and was continued by the ferments of the pancreatic juice; but recent work had shown that the intestinal wall, both of the large and small gut, produced a strong amylolytic ferment. That the pancreatic juice was not as important in starch digestion as one would expect was shown by the fact that in cases of pancreatic deficiency, when there was abundant evidence in the fæces that protein and fat were not well digested, no starch granules above the normal were to be found. Furthermore, in cases in which, after caecostomy, it was possible to obtain pure intestinal juice, this was found to be strongly starch-digesting. Saccharolytic bacteria were rarely found above the large intestine, and as starch, in the normal, was almost completely broken down by the time the lower part of the small bowel was reached, no fermentation of sugar occurred in the bowel. When, however, the small intestine failed to produce enough starch ferment, undigested starch reached the large bowel. In the latter region the starch-splitting ferments altered, and now the resulting sugars were fermented by the ever-present saccharolytic bacteria of the caecum and colon. This process resulted in the formation of much gas and so intestinal distension, a feature of Hurst's carbohydrate dyspepsia and of the condition dealt with by Dr. Le Messurier. This theory of the pathogenesis of the condition fitted in somewhat neatly with the measures proved to be of use in the treatment. As Dr. Le Messurier had pointed out, the diet should contain little raw or once cooked starch, that was, carbohydrate consisting mainly of sugars and partly changed starch; for example, toast should be used. Dr. Beare said he should like to suggest that it was not so much all carbohydrates that were at fault in the diet as the unchanged starch. The weak amylolytic fraction present in these cases could deal only with the minimum of starch, and that partly broken down; the sugars were reasonably well absorbed, as in the normal. He would suggest that the abdominal distension was the means by which the symptoms were originated and that this was a purely mechanical action. He referred to the work done by Alvarez and others. These workers had produced symptoms very similar to symptoms of the disease by inserting rubber bags into the lower bowel and then distending them and leaving them for a time. The discomfort and malaise had been very soon relieved after the removal of the bags. Again, he quoted the experiment in which normal men voluntarily desisted from evacuating their bowels for three days or so. Symptoms very similar to those of the condition under discussion had resulted—headache, depression, dirty tongue, foul breath, anorexia, irritability, insomnia and abdominal distension and slight pyrexia. Evacuation of the large bowel by means of enemata caused abatement of the symptoms within a very short time. Surely this would go to support the idea of the purely mechanical causation brought about by intestinal distension, a feature of the condition. Dr. Beare could not support Dr. Le Messurier's explanation of the nocturnal enuresis, but would suggest that this was due to the pressure and irritation of the distended bowel on the bladder, made worse by the immobility during the night hours.

In regard to treatment he had little to add, except that he had found that compound powder of rhubarb was more effective in the treatment of these cases than the tincture. Whether the magnesia in the former was the factor that counted he could not say; but it was a possibility. He had found small doses of opium effective in relieving the colic. Similarly, the use of arsenic, as suggested by Robert Hutchison, when there was a lienteric type of diarrhœa, had been useful in his experience.

DR. M. T. COCKBURN thanked Dr. Le Messurier for bringing before the notice of members a disorder that was very common, but frequently was unrecognized. He pointed out that the type of child who suffered from this condition was usually "negative", and successful treatment was rendered very difficult because of lack of cooperation of the patient. He had obtained most success in these cases by introducing a capable nurse to take complete charge of the patient in the patient's own home.

DR. E. COUPER BLACK wished to know which part of the intestinal canal was considered at fault and if this intestinal toxæmia described was anything of the same nature as the intestinal toxæmia of adults, talked of largely by the Americans and treated by them with colonic lavage. The Americans claimed great success from a complete washing out of the large intestine, obtained, so they said, by passing a large catheter right into the caecum.

With regard to the large abdomen described, this was also seen in the children of some primitive races, such as the Australian aborigines, who had very little carbohydrate at all in their diet and certainly had none of the starchy foods of European civilization.

DR. D. R. WALLMAN said that he wished to join issue with Dr. Le Messurier in admitting rigidity into the differential diagnosis between intestinal toxæmia and acute appendicitis. If one waited for rigidity in acute appendicitis, one waited too long.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held on Thursday, September 27, 1934, at the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, DR. A. J. COLLINS, the President, in the chair.

Fractures of the Femur.

DR. J. COLVIN STOREY read a paper entitled: "Fracture of the Shaft of the Femur" (see page 675).

DR. LENNOX TEECE read a paper entitled: "Fractures of the Shaft of the Femur" (see page 679).

DR. H. R. G. POATE said that Dr. Storey had made assertions that were surprising, coming from a man whose word carried weight, if only by virtue of his position as an honorary surgeon at the Royal Prince Alfred Hospital. Dr. Storey had made severe strictures on the Ambulance Services and on their treatment of fractured femurs. Dr. Poate doubted if Dr. Storey knew what these Ambulance Services were which he had described so caustically; and if the state of affairs that he described actually existed, then Dr. Storey was culpable in having up till the present shown so little interest in these services. Dr. Poate then gave a short outline of the organization of the Ambulance Services of New South Wales. First in order of seniority came the Order of Saint John of Jerusalem. This Order consisted of two branches: (i) the Association, that had to do with the teaching of first aid alone, and (ii) the Brigade, which was the practical side and which provided the first aid personnel for all sports grounds, pleasure resorts *et cetera*, and for street duty on all occasions of public interest. In New South Wales the Brigade had a district staff, the members of which staff each spent at least twenty-five afternoons a year working in a voluntary capacity. This district staff controlled fifty-five different divisions in the State, in which 1,900 men and women were efficient and all gave voluntary service. This organization cost a minimum of £5,000 a year to maintain; most of this money was subscribed by the members of the Saint John Brigade. Dr. Poate then referred to the New South Wales Ambulance Transport Service, which was a semi-government body, controlled by a board, on which each of the districts established in New South Wales was represented. This was the organization actually responsible for the transport of sick and injured people by means of motor ambulance wagons run by a paid personnel. Last year they had transported 730,000 people, of whom only about 100 had fractures of the femur. In the Central District, which supplied the needs of the city and North Sydney, every ambulance carried a Thomas splint made of an easily transportable pattern, so that it could be fitted into the splint box. In every ambulance there was also a cross-bar that could be fixed into a slot on the stretcher; from this frame the Thomas splint could be suspended firmly. In this way an efficient and easily controlled use of the Thomas splint was attainable. In the ambulance also were ordinary triangular bandages as well as roller bandages for traction; there was also a little windlass for tightening up the bandages that fixed the patient's limb to the splint. In the Central District, not only was every ambulance fitted with a Thomas splint, but all the men were trained to use it, as also were the members of the Saint John Ambulance Brigade, although this splint was not part of their first aid equipment.

Dr. Poate said that in the last three years at the Royal Prince Alfred Hospital there had been only 131 cases of fractured femur. Of these 59% were fractures of the shaft, of which one-third occurred in children from eleven months to fourteen years of age. The remainder were fractures of the neck of the femur. In view of these figures, Dr. Poate questioned the necessity for a Thomas splint as a first aid measure in all cases, and he resented very strongly Dr. Storey's statements that the ambulances were carrying on in a perfunctory manner, were behind the times and antediluvian, and that it was time that some common sense was acquired in first aid matters.

DR. C. E. CORLETTE said that there was not much to say, but that he agreed with 99% of Dr. Teece's remarks. Dr. Corlette had not found the same disadvantages in the sling as Dr. Teece had. The remedy for Dr. Teece's difficulty in supporting the thigh would be found in better balancing of the splint, sliding the two movable suspension members along the splint, proximally to support chiefly the thigh, or distally to support chiefly the leg. Dr. Teece would admit that no matter what the treatment, it was sometimes difficult to get a perfect alignment. It did not seem to Dr. Corlette that he could arrange things any better than he did at present. But if Dr. Teece thought that he could do better, let him by all means continue.

Dr. Corlette said that the question of what to call a Thomas splint worried him. He knew that there was an instrument with a ring that was sold as a Thomas splint, but it was used as a Hodgen's splint. The leg was attached to the splint and then pulled on. But in this case why was there a ring covered with leather? It functioned merely as a spreader. It seemed to Dr. Corlette that they were doing Dr. Hodgen out of credit that ought to be his and not Thomas's.

Dr. Corlette agreed with Dr. Teece about skeletal traction. He never ventured to use a pin through a condyle; perhaps he or Dr. Teece could use it, but it was not safe to teach its use. They knew what happened when men went out into practice and, having insufficient experience, tried to use this method. The pin might sometimes be left in for many weeks, making a permanent suppurating tunnel through the bone.

Dr. Corlette then referred to fractures near the knee joint and said that, no matter what sort of splinting was used, there was liable to be some stiffness and lack of mobility later on. There was apt to be trouble with adherent muscles in front of the leg, as well as with the joints. Dr. Corlette had known traction instruments to be inserted into bone and left in until they had sunk right through the bone to the extent of an inch, or as far as they could go. Anyone allowing this to happen was culpable. The practitioner might have eyes and see not, but he ought to know and watch. As soon as that happened it was his duty to remove the instrument and put in another higher up so that no osteitis from infection would be caused.

In regard to comfort, Dr. Corlette found that skeletal traction was always comfortable for the patient if it was properly done. He had seen the tractor—he did not call it a hook—placed on the limb when the skin was not pulled up before it was applied, so that the skin became bunched up and when any pull was exerted pain resulted. He had sometimes seen the instrument put on after incision with a knife, wounds being made that might later suppurate. He had sometimes seen traction put through the ligaments of the knee joint, causing the patient great agony. These were errors in application; the principles of the procedure were all right.

In conclusion Dr. Corlette said that he did not believe in plating fractured bones. The proportion of disasters after plating was high, 20% or more, and the results were poor in a still greater percentage. If one disaster in five was anything like the truth, the operation was unjustifiable and it was time to say so very plainly.

DR. E. B. M. VANCE said that he had to proclaim himself as being on the side of Dr. Storey. Apart from his strictures on the Ambulance Service, Dr. Vance agreed with everything that Dr. Storey had said. They had just heard Dr. Corlette speak of the dangers of plating, and Dr. Teece and Dr. Corlette describe the troubles arising from skeletal traction. Dr. Vance said that he would like to quote the figures of the results of 700 fractured femurs treated at Liverpool during the war. These results were most brilliant and half an inch of shortening was a rarity. In 700 instances there was practically no shortening or stiffness of the knee afterwards. The Thomas splint produced these results, and Dr. Vance maintained that for fractures of the femur other than those into or just below the hip joint the Thomas splint was incomparably the best. It could be applied in a few minutes without anæsthesia, it gave good alignment and made transport easy. Certainly in the first few days following application of the splint close attention by the surgeon was necessary; it was in that period that the conditions necessary for good convalescence were laid down and that was where surgeons failed in Sydney. Those who failed did not understand the method of Thomas. Some might differ in detail, but the method could be standardized without trouble. What was misunderstood was that the muscles should be thought of first and the bones second. When

Dr. Teece talked of the Thomas splint in conjunction with pulley traction it would seem that he did not understand the principle of the splint. There must be constant traction. The proper application of this method gave beautiful results. In conclusion Dr. Vance said that this question was to him almost as one of religion.

DR. D. J. GLISSAN said that he had been disappointed both in the discussion and in the papers read; for in this year of grace, 1934, two men attached to the leading hospital in the State and men of similar calibre taking part in the discussion had so far confined their remarks to two different methods of splinting. Nothing had been said regarding the principle that underlay the treatment of fractures of the femur. The best treatment was that which in any particular case gave the best results. This was the line on which Dr. Glissan had hoped to hear the papers and the discussion. But all that they had heard had been the disadvantages that attended the use of the other fellow's splint. Something was wrong, because either the splint was at fault or else the method of using it; but the result depended on the man using it. The method to be used was that which was best in the circumstances. They were charged with the teaching of students, and while Dr. Glissan had great respect for Dr. Corlette's work, he did not think it right that students and resident medical officers at Sydney Hospital should go forth equipped only with the most intricate and technical methods learned at that hospital. It was impossible to compare the methods of a man in the back country with those of the man in a big hospital. The man in the country would no doubt get worse results with complicated methods. Dr. Glissan thought that it was stupid to stipulate any one method, whether it was the use of the Thomas splint or of skeletal traction. He had been trained at Liverpool and had seen the successful use of the Thomas splint; and all practitioners who went abroad seemed to favour the Thomas splint. But there were two factors to be considered: first, the splint itself and, secondly, the use of it. No matter how much personal attention the surgeon gave to such cases, he needed a trained team to watch each case and to make the necessary adjustments. Dr. Glissan had not been able to obtain the results with the Thomas method which he had hoped for. At the same time he believed that in some cases the use of the Thomas methods would yield the best results. The particular circumstances attendant upon each case of fractured femur should decide the method to be used in any one. It was nonsense to say that the Thomas method should never be departed from. A recent patient whom he had had to deal with had sustained a fracture of the femur at two different levels and a very severe and extensive compound fracture of both bones of the lower third of the leg on the same side. In such a case he had used skeletal traction to deal with each set of fractures, and was totally convinced that such a method was beyond doubt the best in these circumstances.

In conclusion Dr. Glissan stressed the need for basing methods of treatment of all fractures on certain broad and sound general principles.

DR. W. VICKERS mentioned a simple method of treating fractures of the shaft of the femur in children and adults. This was the Hamilton Russell system of pulleys, which was very simple and satisfactory. It fulfilled the necessary principle of putting the muscles to rest by continuous extension; while resting the muscles it also helped the bones to swing into position.

DR. T. L. O'REILLY said that he would have the temerity to make some dogmatic statements. Over a period of twenty-two years in the Railway and Tramway service of New South Wales he had seen to the bitter end the results of one hundred or more cases of this injury. His statistics showed that among an average staff of 50,000 employees there were only four cases per year arising out of employment. The duration of incapacity of these was a matter of twenty-three and a half weeks. It was Dr. O'Reilly's opinion that in many cases these patients were kept in hospitals and massage departments too long and that they would do better if they were discharged earlier to active work. Muscle wasting and incapacity would disappear if there were less massage and an earlier start of action on the part of the patient. In more cases than not the result of hooks in the region of the knee was a stiff knee.

DR. E. M. HUMPHERY said that when he had read the announcement that the subject that evening was to be fracture of the femur, he did not think that it would become a discussion on the merits and demerits of two types of splints. He had been glad to hear the Hamilton Russell method mentioned. Hamilton Russell said that in bone they were not dealing with a substance like a bit of wood; bones were alive, and if you helped them a little they would help you in return and do far better. There was a stage at which the callus was plastic and could be moulded into the best functional shape.

Dr. Humphery said that he had not been present when Dr. Storey had made his strictures on the Ambulance Service. But as Honorary Secretary of the Ambulance Services he took great exception to what had been said. Dr. Poate, during his travels abroad, had found that there was no more efficient service than the Central District Ambulance; they tried out every new method that came along; if it was good they adopted it, and if it was not they left it alone. One of the things that the ambulance men were taught was the use of the Thomas splint. Dr. Humphery said that he could not speak with authority of ambulances outside the metropolitan area.

Dr. Humphery referred to his experience of the Schmerz hook and mentioned an instance when the bone had been soft and the hook had gone right in. He suggested that hooks should be designed with little points that broadened out into a shoulder, like the lead that came out of an "Eversharp" pencil. This would prevent the hook from going too far into the bone.

In conclusion Dr. Humphery said that he had made a variation of the Hamilton Russell method of pulley blocks. By using two extension weights instead of one worked with pulley blocks, a pull of from 24 to 25 pounds could be exerted.

DR. P. FIASCHI asked Dr. Poate whether the civil ambulances carried a collapsible canvas stretcher similar to those used in the front line trenches in the late war. The necessity for these was brought home to him in having a gentleman who, in the morning, had a second stroke, transferred in the evening to his city flat. The elevator, although of the larger size, would not accommodate the rigid stretcher, and the patient was lifted in on the blankets. A collapsible canvas stretcher was essential in transferring patients from houses with narrow staircases, or apartments with small elevators.

DR. HOWARD BULLOCK said that he was disappointed that no mention had been made of the use of Kirschner wire for skeletal traction through the tuberosity of the tibia in fractured femora. Nordenbos, of Amsterdam, in 1927 had demonstrated to him the after-results of many cases of fractured femora treated by this method. While attending Böhler's classes in Vienna in the same year he had seen the same method used extensively with neither stiffness nor flailty of the knee joint resulting. He found the method very helpful in dirty compound fractures of the lower part of the femur.

DR. H. A. SWEETAPPLE felt that everybody must agree with Dr. Glissan that the best method was that which gave the best results. He had been impressed by the Thomas splint and by the results obtained at Liverpool, and had not changed his views since. In regard to the question of restoring the length of the limb after fracture, Dr. Sweetapple said that the Thomas splint was perfectly adequate to prevent shortening. He mentioned a series of sixty-one fractured femora treated in one year, by one surgeon, at Liverpool in which the patient's ages varied from two years to sixty-seven years. In eight cases there was up to half an inch of shortening, twenty-two were normal, while thirty-one had up to half an inch of lengthening. Dr. Teece had said that it would be obvious that the only efficient method of traction was skeletal traction. If the criterion of efficiency was the restoration

of length, then the method at Liverpool of skin traction must be efficient.

Dr. Storey in reply, first to Dr. Teece, said that the ring of the Thomas splint could be left on indefinitely if it was used intelligently; the site of the point of pressure on the skin could be altered when the level of the splint was changed. Dr. Teece had said that continuous traction was necessary; he ought to have said that in the hook method traction was continual. Dr. Teece had mentioned weight with the Thomas splint. Dr. Storey said that the splint lost its whole point if it was pulled away from the *tuber ischii*. Traction on the splint destroyed the physics of the splint. Fixed traction would not fail to overcome shortening.

Dr. Storey said that the Thomas splint should fit snugly and that an up-to-date hospital should be stocked with splints of many sizes. At the same time it was easy to make the splint fit by the use of a pad if it was too big, or to cut the ring with a hacksaw if it was too small. Dr. Teece had said that sagging could not be checked; but Dr. Storey said that he made it impossible for sagging to occur. The use of hooks in children was impossible, owing to the risk of injuring the epiphysis. In regard to measurements, Dr. Storey said that not enough instruction was given to students; it must always be remembered that in any observation of measurements they should allow for an observation error of half an inch at least. Dr. Storey considered that too much attention was paid to the X ray picture.

The reply to Dr. Poate was too easy, Dr. Storey said, because all Dr. Poate's remarks had been quite irrelevant. Dr. Storey would be the last person to criticize the ambulances as a whole, but he repeated that their methods of transporting patients with fracture of the thigh were antediluvian. Dr. Poate, in his review of ambulance services, had not told them how many patients were actually carried on Thomas splints.

Dr. Storey said that he was glad of Dr. Corlette's support in what he had said about plates; it was bad surgery to use them. It was quite true that in some instances the Thomas splint was being used as a Hodgen's splint.

Dr. Storey agreed with Dr. Vance that personal attention was important in fractures of the femur. This was the difficulty in a public hospital, where so much work had to be deputized.

Dr. Storey was sorry that Dr. Glissan was disappointed. He agreed that every case should be approached on its merits; moreover, it was not so much the method as the man behind it that counted.

In regard to Hamilton Russell's method, Dr. Storey said that he had studied it and could get good results. It was essential to put up both limbs, but again the extension was continued and not continuous.

He agreed with Dr. O'Reilly that in general massage did more harm than good.

Dr. Storey said that what Dr. Bullock had said about traction through the head of the tibia seemed to him surgically unsound.

In conclusion Dr. Storey said that he would like it to be understood that he bore no one any ill-will; but when he saw something that was wrong he would do his utmost to have it corrected.

Dr. Teece, in reply, said that he did not mind if other speakers differed from or derided him, but he did object if he were not listened to. Dr. Glissan had complained that the evening had degenerated into a contest of one splint against another instead of dealing with the general principles. Dr. Teece reminded him that in opening his paper and afterwards with almost wearisome repetition he had emphasized the one outstanding principle which was the need for continuous efficient traction. Dr. O'Reilly was under a misconception if he thought that orthopædic surgeons did not see their cases to the bitter end. Orthopædic surgeons differed from the general surgeons in that throughout the whole period of their hospital service they continued to see out-patients, and, unlike the senior general surgeons, did not lose sight of their patients when they were discharged from the ward. He agreed with Dr. O'Reilly that far more often these patients were given too much unnecessary massage. Massage was only of use in reducing œdema; it did not at all contribute to muscle development. It was necessary, however, to make these patients report back to hospital and to exercise supervision over them to see that they moved their joints and did not develop a habit limp and took the necessary degree of exercise. Some degree of supervision was necessary until they were discharged as fit for work. If they were discharged before this time was reached his experience was that if they were workers' compensation cases they were too apt to spend their days sitting on a bench in a park picking the winners for the races instead of taking the exercise prescribed.

He agreed with the inadvisability of exercising traction through the tibia. Such traction exerted a pull through the ligaments of the knee joint. The result of this would not be stiffness of the knee joint, but rather undue stretching of the ligaments, resulting in an unstable knee.

Too few surgeons could contribute anything of value to the discussion, for the sole reason that they never knew what the results of their treatments were. They had their last view of the patient when he left the hospital ward, possibly still on crutches, or at the best still in a walking caliper, and they never knew if he ever became fit to return to his original occupation. If the surgeon were of an optimistic temperament he hoped for the best and expressed himself as satisfied with his method of treating these fractures. General improvements in results would never follow till it became the rule, and not the exception, for every surgeon to see these fractures again at least as late as twelve months after their discharge from hospital.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at Saint Vincent's Hospital on September 20, 1934. The meeting took the form of a series of demonstrations by the members of the honorary staff. Parts of this report appeared in the issues of November 10 and 17, 1934.

Tic Douloureux.

DR. W. MAXWELL showed a male patient, aged seventy years, a pensioner, who was admitted to hospital on January 9, 1934, complaining of severe pain in the upper right jaw and along the angle between the right side of the face and the nose as high as the inner canthus; also in the right supraorbital region. No pain was present in the lower jaw. The pain was very severe and stabbing in character, and the attacks continued for two weeks. Paroxysms occurred every few minutes and were induced by movement, cold, taking of food and talking. They were accompanied by lachrymation of the right eye and excess of salivation. The pain first had begun one and a half years previously and had steadily grown worse, occurring at intervals of two weeks.

On examination the patient's face became contorted with pain. He covered his face with his hand and was restless. The right side of the face was very sensitive; slight pressure induced a paroxysm. "Veramon" gave a little relief. The Wassermann test gave no reaction. The ocular fundi were normal.

Operation was performed on January 23, 1934. The Hartley-Krause approach was used. The middle meningeal artery was divided. The third division of the fifth nerve was defined at the *foramen ovale* and followed back, and the capsule of the ganglion was incised. The trigeminal trunk was identified passing over the apex of the petrous part of the temporal bone and entering the capsule. The trunk was divided flush with the ganglion and the proximal segment was avulsed. About one inch of nerve trunk came away. The lids of the right eye were sutured later for corneal ulceration. The eye was normal at the time of the meeting and the neuralgia was relieved completely.

Dr. Maxwell also showed a woman, aged sixty-two years, who suffered from *tic douloureux*. She was admitted to hospital on December 5, 1933, complaining of attacks of pain on the left side of the head and face since July, 1932. The pain commenced in the lower lip and travelled around to the ear and up to the top of the head.

On examination the pain was found to involve the superficial distribution of the inferior alveolar nerve and the auriculo-temporal (third division). It was severe, but not definitely paroxysmal; it was gradually becoming worse and there was no hyperæsthesia.

On January 9, 1934, alcohol was injected into the third division outside the *foramen ovale* with no result. The patient felt tingling along the lower jaw when the needle supposedly entered the nerve, but "Novocain" and alcohol produced no effect.

On January 16, 1934, the superficial temporal nerve was divided above the posterior end of the zygomatic arch and the inferior alveolar nerve was divided immediately below the mandibular foramen, producing anæsthesia and affording relief.

Dr. Maxwell's third patient with *tic douloureux* was a man, aged sixty-one years, a watchman. In February, 1930, the patient had suffered from right frontal pain and pain over the right maxillary area involving the right upper alveolus slightly. Paroxysms occurred and the pain interfered seriously with mastication and rest at night. The patient was then operated on by Sir John McKelvey, but hæmorrhage from the diploe necessitated abandonment of operation and ligation of the right external carotid artery. Division of the right supraorbital, supratrochlear and infraorbital nerves followed, with relief for two months.

In June, 1931, the patient was readmitted with more severe pain in the right frontal region, right maxillary area, and right upper alveolus and corresponding half of the palate. The pain came on at first in the morning, or when the head was lowered. The patient could not wear a denture, and taking of food or touching the alveolus induced a paroxysm. At first intermittent, the pain for the previous two months had been practically continuous, and the patient was wasting from lack of food and sleep.

On June 4, 1931, the maxillary division of the nerve was sectioned from within at the *foramen rotundum* and the foramen was plugged with wax. The Hartley-Krause technique was used. Complete relief of pain followed.

Jaundice.

Dr. Maxwell's next patient was a woman, aged forty-one years, who was admitted to hospital on June 17, 1934, complaining of: (i) generalized pruritus of two to three years' duration, (ii) a dull yellowish discoloration of the skin for three years, (iii) attacks of umbilical pain for three to four years, (iv) loss of weight.

Four years ago the patient had an attack of pain immediately above the umbilicus, vomited, was "doubled up", and went to bed. The pain radiated to the back and to the right shoulder. Since then attacks had occurred every few weeks. After the first few attacks the patient noticed a discoloration of the skin, which was previously very fair. The discoloration progressively deepened. The appetite was poor; she could not eat fats. The bowel action was regular. The motions were at times pale. The Wassermann test gave no reaction. Graham's test revealed a poorly functioning gall-bladder.

At operation on June 19, 1934, the gall-bladder was found to be normal. The common duct was incised, probes and sounds were passed down to the ampulla of Vater, but would not enter the duodenum. The head of the pancreas was very hard. An enlarged soft gland (subpyloric) was removed for biopsy. The fundus of the gall-bladder was anastomosed to the terminal part of the pylorus. Biopsy of the gland revealed inflammatory changes. The patient said that the colour improved after operation, but this was doubtful.

Rhinoplasty.

Dr. Maxwell also showed a male patient, aged fifty-four years, a clerk, who, in June, 1931, had his nose removed for basal-celled carcinoma. A little more than one-half of the nasal bones were preserved above, the lower margins of the nares and the anterior-inferior spine of the septal cartilage below. In June, 1932, no recurrence had taken place and restoration of the nose was commenced. This was carried out with local anæsthesia throughout, and in stages at two-monthly intervals. The following were briefly the stages:

1. A skin flap was raised from the left side of the neck and tubed, attachments of the tube graft being above along the lower border of the mandible, and below at the level of the clavicle.

2. The lower attachment of the tube was transferred to the soft tissue around the lower septal spine and adjacent upper lip.

3. The upper attachment of the tube was transferred to the left side of the facial surface of the upper lip.

4. The central pillar of the nose was formed by implanting a segment of that part of the tube attached to the septal spine into the soft tissues over the lower end of the remaining nasal bones. The free end of the remaining segment was implanted laterally at the margin of the left nasal aperture.

5 and 6. The left and right sides of the nose were formed.

7 and 8. The lateral and central portions were joined on either side.

9. Final trimming was carried out.

Ectopia Testis.

Dr. Maxwell's next patient was a boy, aged eleven years, who had been admitted to hospital for operation for subacute appendicitis. On examination it was also found that the scrotal raphé deviated to the right and that the right compartment of the scrotum was empty. The condition had never been noticed by the patient or his parents. The testis could not be palpated in the inguinal canal.

At operation a testis of normal size was found at the abdominal ring, with the structures of the cord looped downward in the canal. The coexistent hernial sac was obliterated at its neck by adhesions. Orchidopexy was carried out by the method described by Rowlands and Turner in "Jacobson's Surgery". The testis and cord were freed in the usual manner, the scrotum was incised in front to the left of the raphé (on the opposite side), a bed was prepared in the left compartment, and an artery forceps was passed through the scrotal wound and thrust onward through the raphé. The opening thus made in the latter was enlarged by opening the blades of the forceps, which were then passed further on and opened as far as the upper wound. A suture was passed through the severed gubernaculum, grasped by the forceps, and the testis was drawn through the opening in the raphé into the bed prepared for it. No sutures were passed through margins of the opening in the raphé, which contracted down on the cord.

Hydronephrosis.

Dr. Maxwell showed a pyelogram taken from a male patient, aged sixty-two years, a steward, who was admitted to hospital on November 10, 1933. He had been struck on the left loin with an improvised rope ball while playing deck cricket. At the time he "suffered shock" with nausea, and vomited. On the following day he passed a small amount of blood in the urine and came to hospital.

On his admission to hospital his temperature was 36·1° C. (97° F.), his pulse rate was 50 and his respiratory rate 20 in the minute. Much bright red blood was present in the urine. There was neither pain nor tenderness in the abdomen or loin. Some soreness was noted over the lower left ribs in the mid-axillary line. X ray examination of the renal tracts revealed no abnormality. On November 21, 1933, double pyelography revealed dilatation of the right renal pelvis without any clubbing of calyces. Very short demarcation at the uretero-pelvic junction suggested the presence of an abnormal renal vessel causing pressure. On the left side (site of injury) there was a huge dilatation of the renal pelvis with marked clubbing of all major calyces.

On December 5, 1933, left nephrectomy was performed. An abnormal renal artery was found passing to the lower pole and kinking the uretero-pelvic junction.

Polycystic Disease of the Kidneys.

Dr. Maxwell also showed a pyelogram taken from a male patient, aged thirty-nine years, a labourer, who was admitted to hospital on March 2, 1934, complaining of a peculiar sensation in the right hypochondrium and of being "full of wind". He had no pain or discomfort. He had a very "big stomach" all his life. He had no other symptoms.

On examination the patient was a spare, pale person. A protuberance was visible on the left side of the abdomen, extending downward to the iliac crest and to the mid-line at the level of the umbilicus. It descended on inspiration. Its surface was smooth, its border was notched above, and it extended up under the ribs. It was tensely cystic. There was an area of resonance over its medial border. The lower border of the liver extended 7·5 centimetres (three inches) below the right costal margin. A mass was palpable in the right loin; it was very hard. Both lateral masses were palpable bimanually. The patient passed 27, 42 and 54 ounces of urine on successive days. A blood count revealed secondary anæmia. The blood urea was 46 milligrammes per 100 cubic centimetres of blood. The Wassermann test gave no reaction. The urea concentration specimen *A* contained 1·25% and specimen *B* contained 1·2% of urea. The urinary deposit contained occasional red cells, leucocytes and epithelial cells, but no gross pus or blood; epithelial and granular casts were very scanty. The systolic blood pressure was 140 and the diastolic pressure 90 millimetres of mercury. Bilateral pyelograms showed two very large polycystic kidneys.

An Obscure Kidney Condition.

Dr. Maxwell showed a pyelogram taken from a male patient, aged fifty years, who was admitted to hospital on November 19, 1933, with a history of sudden acute pain in the right iliac fossa, commencing one hour before. Nausea was present, but no vomiting. No previous attacks had occurred. The patient's bowels were open on the previous evening; he had no urinary symptoms. His temperature was 36·7° C. (98° F.), his pulse rate was 76 and his respiratory rate 20 in the minute. He lay groaning in bed, pale and sweating. He appeared to be suffering from exacerbations of pain. He did not move. He had to be assisted to walk to bed. The abdomen did not move with respiration; well marked rigidity of the whole abdomen was most pronounced in the right iliac fossa. Tenderness was most marked in the right iliac fossa and in the epigastrium. The urinary deposit contained a few pus cells, a few red cells, but no casts. No tubercle bacilli were found in a twenty-four hour specimen; triple phosphates and amorphous phosphates were found, but no cholesterin crystals. At operation no cause was found for the patient's condition. The appendix was removed.

On December 6, 1933, a pyelogram revealed a shadow on the right side, in the line of the ureter; this was probably due to a calculus. There was a filling defect in the pelvis and calyces of the right kidney, due either to a tuberculous lesion or to a blood clot.

On December 12, 1933, the right kidney was explored at operation with a negative result.

Fracture of the Pelvis and Tibia followed by Complications.

Dr. V. J. KINSELLA showed a boy, aged fifteen years, who was admitted to hospital on March 1, 1934, after being struck by a motor car on the left hip. Examination revealed a fracture of the left ilium, a segment being broken off the crest, and a fracture of the left tibia.

After the accident the patient was not able to pass urine for two or three days, but his bladder was catheterized without difficulty. The bowels also did not open. The patient complained of a good deal of abdominal discomfort, the abdomen soon becoming distended and silent, with fixed dulness in the left flank. Aperients and enemata were administered, together with pituitrin, eserine and strychnine. The bowels acted on the sixth day and the distension gradually subsided.

On March 20 the patient complained of pain in the left side of the chest, the breathing was distressed, the apex beat was 2·5 centimetres (one inch) outside the nipple line, and the pulse rate had risen. X ray examination revealed a dulness at the left base and a shift of the mediastinum to the left. The temperature then began to rise, and the patient was seen by Dr. Tansey, who found pneumonia of the left lung. His condition improved under medical treatment until April 12, 1934, when he again complained of pain in the chest. The temperature rose again and signs of fluid began to appear. The patient at this stage was extremely emaciated. X ray examination showed the mediastinum to be pushed back again towards the right. The chest was aspirated and pus withdrawn. This proved sterile on culture. Thoracotomy was performed on May 3 under local anæsthesia, the Tudor-Edwards tube and the closed method of drainage being used. The temperature came down in a dramatic fashion and the patient was discharged on June 7, very emaciated and with tachycardia still present, but with the wound almost healed. Since his discharge he had regained his normal weight, the tachycardia had disappeared, and the wound had healed. X ray examination showed the mediastinum again drawn slightly to the left, and the apex beat was slightly outside the nipple line.

Dr. Kinsella said that probably the sequelæ of this patient's accident were due to the reflex protective inhibition of respiratory movements on the side of the injury and to an extensive hæmorrhagic infiltration of the retroperitoneal tissue interfering with the function of the visceral nervous system.

Nerve Suture.

Dr. Kinsella then showed a man, aged thirty years, who was admitted to hospital with a stab wound of the forearm, causing wrist-drop, through division of the dorsal interosseous nerve. End-to-end suture of this nerve was performed within four hours of the accident. Function showed clear clinical evidence of return after four months, and seven months after the injury the patient had full extension of the wrist and fingers and full abduction of the thumb. Extension of the thumb was not yet complete, but was improving. The radial extensor muscles were still weak.

Lipoma Causing Paralysis.

Dr. Kinsella's third patient was a woman, aged fifty years, who had noticed a lump on her left forearm for seven years and increasing weakness of the left wrist and hand for three years. The lump was deeply situated over the upper third of the radius. There was paresis of extensors of the wrist and fingers, practically a complete paralysis of extensors of the index and middle fingers. Operation was performed on May 3, 1934. The supinator muscle and the dorsal interosseous nerve were found stretched and thinned out over a subjacent lipoma. This was tightly grasped by the muscle and nerve and a prolongation was adherent in the interosseous space, just distal to the elbow joint. Four months after the operation the radial carpal extensors and the extensors of the thumb, index and middle fingers had recovered a good deal of power. The ulnar extensors had not shown any signs of improvement.

Osteochondritis Juvenilis.

Dr. Kinsella showed a boy, aged five years, who had been limping for two weeks, with pains in the right foot. Examination revealed tenderness and slight swelling over the medial aspect of the tarsus, and X ray examination revealed *osteochondritis juvenilis* of the scaphoid (Köhler's disease). Changes of similar nature, but less marked, were revealed in the radiogram of the opposite foot. The inner border of the right boot was banked, and the symptoms disappeared in a few days.

Osteomata.

Dr. Kinsella showed a girl, aged eleven years, who complained of pains on the inner side of the right knee for some months, coming on after walking. There was also slight occasional discomfort on movement in the shoulders. Physical examination revealed a slight swelling over the

medial aspect of the upper end of the right tibia and well marked "lipping" of the first cuneiform in each foot. X ray examination revealed a small cancellous osteomata in these situations, also tiny outgrowths in each shoulder joint at the margins of the diaphysis of the humerus.

Cystic Degeneration of the Meniscus of the Knee Joint.

Dr. Kinsella showed a girl, aged nineteen years, who had complained of pain in the knee joint for four years; the pain was becoming worse and was aggravated by exertion. Examination revealed a cystic swelling as large as a pigeon's egg over the lateral aspect of the knee, directly on the line of the joint, and in front of the fibular collateral ligament. This swelling disappeared into the joint on acute flexion of the joint, a sign noticed in two similar cases previously observed. A diagnosis of cystic degeneration of the lateral meniscus was made. Operation was performed on July 26, 1934, and the cystic cartilage was removed as completely as possible, only a small piece of the posterior end being left. The specimen was demonstrated. The knee was shown to be quite comfortable, the patient easily sitting on her heels and standing upright again.

Osteochondritis dissecans.

Dr. Kinsella showed a woman, aged sixty-four years, with *osteochondritis dissecans* of the ankle following on an injury three months previously. The pain and disability failed to become less under conservative measures, and the joint was opened on July 24, 1934. A flake of necrosed bone and cartilage was removed from the articular surface of the tibia. Microscopic slides of the decalcified specimen showed no bone or cartilage cells, but a loose, fatty connective tissue which had been calcified. Movements in the ankle were free, and weight-bearing was being gradually undertaken.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Women's Hospital, Melbourne, on August 2, 1934. The meeting took the form of a series of demonstrations by members of the honorary staff.

Acute Pelvic Inflammation.

DR. A. SHERWIN showed three cases of acute pelvic inflammation, together with the diathermy apparatus and electric body bath used in their treatment.

In each instance the pelvic cellulitis followed an early miscarriage.

In the first case, the patient being admitted to hospital with a temperature of 39·2° C. (102·6° F.) and a pulse rate of 116, a posterior colpotomy was performed and a large amount of offensive pus was obtained. Subsequently the patient was nursed in the Fowler position and treated by douching and thermo-therapy; all evidence of inflammatory mischief completely disappeared.

In the second and third cases there occurred a gradual subsidence of pyrexia to normal, and with it a steady diminution in the size of the pelvic mass. The treatment in both instances consisted in nursing in the Fowler position, stimulating dietetic and medical treatment, douches and thermo-therapy.

Cardiac Failure Complicating Pregnancy.

DR. W. D. SALTAU'S first patient was a *multipara*, aged thirty-one years, in her fourth pregnancy, which had advanced to thirty weeks. Five weeks before admission to hospital she had had an attack of cardiac failure with some degree of pulmonary œdema, which cleared up with appropriate treatment. She had been kept in bed since then until admission on July 16, 1934.

Her history was that she had had "rheumatism in all her joints" when aged sixteen. She was not put to bed. At the age of twenty-three she was told that she had a "strained heart muscle". There was no history of rheumatic recurrences. Her previous three confinements were normal, the babies averaging about 3·27 kilograms (seven and a half pounds).

On admission to hospital she was quite comfortable, but displayed marked malar flushing and some cyanosis and clubbing of the fingers. The resting pulse rate was 100 per minute. The systolic blood pressure was 160 and the diastolic pressure 110 millimetres of mercury. Examination of the heart revealed a systolic thrill at the apex. There were presystolic and systolic murmurs, with reduplication of the first sound. The second sound at the pulmonary area was accentuated. The aortic area was clear. The liver and spleen were not palpable, and there were crepitations at both bases. There was no œdema of the legs. The patient was regarded as suffering from mitral stenosis with decompensation. She was given 2·0 cubic centimetres (thirty minims) of tincture of digitalis three times a day. The pulse rate remained for some days about 100. The main question was the management of her present pregnancy. It was questionable whether termination now would help the heart condition, which, it was hoped, would improve with prolonged rest in bed, and the premature child would almost certainly not survive. As against that, if she were carried on to term, it was doubtful how she would stand the stress of labour. If possible, Dr. Saltau intended to carry on with her until near term and then perform Cæsarean section followed by sterilization; probably he would use gas anæsthesia. It was obvious that further pregnancies were impossible.

Rheumatic Endocarditis Complicating Pregnancy.

Dr. Saltau's second patient was a three *para*, aged twenty-three years. Her past history showed that she had had chorea when aged eleven years.

On March 2, 1933, she had been admitted to the Melbourne Hospital with rheumatic endocarditis complicated by a mild attack of pulmonary œdema. At that time the heart was a little enlarged. There were systolic and diastolic murmurs at the mitral area. The aortic area was clear. There were crepitations at both bases and some œdema of the feet. The systolic blood pressure was 158 and the diastolic pressure 110 millimetres of mercury. There was no albumin in the urine. Whilst in the Melbourne Hospital she was considered to have a mitral stenosis with cardiac failure and œdema of the lungs. She was given tincture of digitalis, 1·0 cubic centimetre (15 minims) three times a day. Her pulse rate was over 100 for the first week in hospital. She left hospital at her own risk in three weeks. Her obstetrical history showed that she had had two confinements, the first four, and the second three years ago. There was no cardiac trouble then. On July 20, 1934, she was admitted to the Women's Hospital well advanced in labour and had a normal and easy delivery. There was some degree of albuminuria, but there were no symptoms therefrom.

On examination her heart was not enlarged. There were systolic and diastolic murmurs at the mitral area. The aortic second sound was accentuated but clear. The systolic blood pressure was 185 and the diastolic pressure 126 millimetres of mercury. The Wassermann test gave no reaction. Her renal function tests gave the following results. The blood urea was 21 milligrammes *per centum*. The urea concentration figures were 1·48, 2·16, 2·51. The albumin has persisted during the puerperium. This fact, together with the raised blood pressure, suggested that she had a nephritis in addition to the cardiac condition, but the chief point of interest was that, although sixteen months previously, she had shown evidence of cardiac failure, she successfully negotiated the present pregnancy without any serious cardiac breakdown. It was interesting to contrast her with the previous patient shown.

The Biological Diagnosis of Pregnancy.

PROFESSOR R. MARSHALL ALLAN presented a summary of the various tests which had been used to diagnose early pregnancy. In this respect he stated that three names were outstanding and each marked a definite advance in knowledge, namely, Hegar, Abderhalden, Aschheim.

The only accurate tests were those of Aschheim-Zondek and Friedman. The latter seemed to give slightly better results. Very many other tests had been reported, but, as they could not show more than 80% of accuracy, they were not sufficiently reliable for clinical use. Recently

Kapeller-Adler, of Vienna, had reported 96% of success with a modification of the bromine method originally used by Voge. This test was demonstrated, but Professor Allan had found that it was not so simple as the original article suggested. It was possible that the pH of the urine might require estimation, because marked acidity of the sample seemed to affect the result.

The stages in the concentration of the gonadotropic hormone in the urine according to the Edinburgh technique were demonstrated. Microscopic and macroscopic specimens of the Friedman test were shown, also the Aschheim-Zondek reaction on female mice, and the Brouha test with male animals. The œstrous cycle in the rat, as shown by vaginal smears, was demonstrated, and these changes were correlated with the effects on the uterus and ovary.

Professor Allan was glad to acknowledge his indebtedness to three students of the obstetric class for the preparation of the various specimens shown.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Bryan, Sidney William, M.B., B.S., 1933 (Univ. Sydney), Sydney Hospital, Sydney.

Harris, Godfrey Moses, M.B., B.S., 1932 (Univ. Sydney), Wyangala, New South Wales.

Metcalf, Arthur William, M.B., B.S., 1933 (Univ. Sydney), The Women's Hospital, Crown Street, Sydney.

Correspondence.

A VOLUNTARY BLOOD TRANSFUSION UNIT.

SIR: I have been asked to publish the rules of our voluntary blood transfusion unit, as a possible guide and stimulus to other centres in the establishment of similar units.

The volunteers here are all drawn from the Apex Club and consist of healthy men under the age of thirty-five years. It should be easy to collect a similar group anywhere. At a meeting of the club the use of such a unit was explained and, in conjunction with their office-bearers, a set of rules was drawn up which seemed to cover the necessary points.

Dr. Johnson, of the Department of Bacteriology at the Royal Prince Alfred Hospital, kindly provided me with enough typing serum to make a start, and we hope to keep enough in stock for our needs by taking a little from the members, say every six months. The Board of Health has been good enough to perform the routine Wassermann tests of all prospective donors.

As will be seen by looking at the rules, care has been taken to make sure that the donors are suitable, and also that they are not used like the village pump. Records are kept by the Secretary and myself of the name, address and telephone number of each donor, his type, the date and result of his Wassermann test, the date and amount of blood taken, by whom, for what purpose, and the result.

A note is made of the general suitability of the donor and the size of his veins. The typing serum is kept at Saint Vincent's and the Bathurst District Hospitals.

A copy of the rules is appended.

Yours, etc.,

BROOKE MOORE, F.R.C.S. (Edin.).

Bathurst,
New South Wales,
November 12, 1934.

APEX CLUB OF BATHURST.

Fellowship No. 13. Service.

VOLUNTARY BLOOD TRANSFUSION UNIT.

Rules.

Donors.

1. All members are to have preliminary tests performed to ascertain their blood group, and a blood test.

2. Donors are to be available to all persons requiring blood, at the request of their doctor.

3. Donors are not to be asked to give their blood, except in urgent cases, unless a reasonable attempt has been made to obtain blood from relatives or friends of the patient concerned.

4. Donors are not to be used more often than once in four months, unless there is extreme urgency.

5. Donors are to be directly typed against the patient, except in extreme urgency, as blood groups change.

6. Donors are to be permitted to refuse to give blood at any time, without reason or comment, and to resign from the unit on the same terms.

7. Donors must refuse to act if they know that they are suffering from any disease which is possibly transmittable.

8. Donors are to realize that sometimes their services will not result in success, though there will be no doubt that, over even a small series of cases, they will certainly be the means of saving life.

Recipients.

1. Recipients are to be informed that they are under no obligations whatever either to individual donors or to the Club.

Medical and Hospital Authorities.

1. As the purpose of the Club is to give service, publicity on the part of the donors is to be discouraged; and individual names of donors are not to be handed to the Press for publication.

2. Full records are to be kept by the Secretary, and the names, addresses and other information of available donors is to be available at the Bathurst District Hospital and Saint Vincent's Hospital, Bathurst.

3. Except as provided for in Section 4 hereunder, all requests for donors shall be made to the Secretary of the unit by the proper authority/ies, stating the group or type required. The Secretary will then make all arrangements for the transport of the available donor/s to the appointed place.

4. In extreme urgency, and only when the Secretary is not able to be communicated with immediately, requests for donors may be made direct to members by the proper authorities.

The Secretary, P. A. SCHOFIELD.
By day: The Bank of Australasia ('phone 277).
By night: 129, William Street ('phone 595).

THE ALLANTOIC MEMBRANE OF THE EMBRYO CHICK AND ITS X RAY REACTIONS.

SIR: The Cancer Research Committee of the University of Sydney decided in July of this year that, in view of the conflicting results obtained by various workers employing Dr. Moppett's technique, a series of specially controlled tests should be made by Dr. Moppett in collaboration with another worker, with a view of comparing the effects of homogeneous and heterogeneous X radiation on the chorio-allantoic membrane of the chick embryo, so that an authoritative statement could be made concerning the fundamental claim made by Dr. Moppett.

Publication of the paper by Dr. Moppett, entitled "Further Observations on the Allantoic Membrane of the

Embryo Chick and its X Ray Reactions", appearing in THE MEDICAL JOURNAL OF AUSTRALIA on November 17, 1934, was authorized in January last, but the publication was delayed for reasons which need not be discussed here. Our purpose in sending this note is to make it clear that Dr. Moppett's discussion and conclusions in this paper are not based on the special control tests now in progress.

Yours, etc.,
D. A. WELSH.
O. U. VONWILLER.

The University of Sydney,
November 19, 1934.

A REQUEST.

PROFESSOR HAROLD R. DEW, Professor of Surgery in the University of Sydney, is anxious to obtain for his department second-hand copies of the following books:

Macgillvray, "Hydatid Disease", 1890.
Thomas, "Hydatid Disease", 1894.
Bird, "Hydatid Disease of the Lung", 1890.
(The dates of publication are approximate.)

Readers who have copies of these books and who would be willing to let Professor Dew have them for his department are requested to communicate with him.

NOTICE.

THE Committee of the Officers' Mess of the Australian Army Medical Corps, Second Military District, is arranging to hold an informal gathering on Saturday, December 15, 1934, to welcome Colonel R. M. Downes, the newly appointed Director-General of Medical Services. Members of the mess (and those eligible for membership) are asked to keep this evening free. Further details will be published in these columns when final arrangements have been made.

Diary for the Month.

Nov. 27.—New South Wales Branch, B.M.A.: Medical Politics Committee.
Nov. 28.—Victorian Branch, B.M.A.: Council.
Nov. 29.—South Australian Branch, B.M.A.: Branch.
Nov. 29.—New South Wales Branch, B.M.A.: Branch.
Dec. 3.—New South Wales Branch, B.M.A.: Organization and Science Committee.
Dec. 4.—Tasmanian Branch, B.M.A.: Council.
Dec. 4.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
Dec. 5.—Western Australian Branch, B.M.A.: Council.
Dec. 5.—Victorian Branch, B.M.A.: Council.
Dec. 5.—Victorian Branch, B.M.A.: Branch Annual Meeting.
Dec. 6.—South Australian Branch, B.M.A.: Council.
Dec. 11.—Tasmanian Branch, B.M.A.: Branch.
Dec. 11.—New South Wales Branch, B.M.A.: Ethics Committee.
Dec. 13.—New South Wales Branch, B.M.A.: Branch.
Dec. 13.—Victorain Branch, B.M.A.: Council.
Dec. 14.—Queensland Branch, B.M.A.: Branch Annual Meeting.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages xviii, xix. and xx.

ADELAIDE HOSPITAL, ADELAIDE, SOUTH AUSTRALIA: Resident Medical Officer.

BALLARAT AND DISTRICT BASE HOSPITAL, BALLARAT, VICTORIA: Medical Superintendent.

DEPARTMENT OF MENTAL HYGIENE, MELBOURNE, VICTORIA: Junior Medical Officer.

DIRECTOR-GENERAL OF HEALTH, SYDNEY, NEW SOUTH WALES: Assistant Medical Officer of Health.

INFECTIOUS DISEASES HOSPITAL, FAIRFIELD, VICTORIA: Junior Resident Medical Officer.

LAUNCESTON PUBLIC HOSPITAL, LAUNCESTON, TASMANIA: Resident Medical Officers.

PERTH HOSPITAL, PERTH, WESTERN AUSTRALIA: Resident Medical Officers.

UNIVERSITY OF OTAGO, DUNEDIN, NEW ZEALAND: Senior Assistant.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associate Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointment and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	Officer of Health, District Council of Elliston. All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

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